

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 8/11/2003 4:21:23 PM
Subject: Re: IPSC Low NOx Burner Spec Attachments

Phil;

What we need now are the following:

1. The B&W summary performance sheet.
2. The B&W mill coordination sheet.
3. What is the current NOx and LOI levels on Unit 2 at full load and what is the normal excess air? Also, for Unit 1, what are these values with the OFA open?
4. Do the boilers normally operate with all mills in service; or is one mill out normal?
5. What are the typical mill finenesses?

We need 1 & 2 to determine the primary air and secondary air flows properly size the equipment.

And knowing the current configuration's performances allows us to more accurately develop guarantees.

Since no required guarantees were listed in the spec, I assume that you want minimum NOx that our equipment is capable of without any deleterious effects to the boiler.

Please FAX items 1&2 to us at: 908-470-0479.

We need this immediately since the time allowed is minimal.
Please copy Sal Ferrara on any e-mails.

Thank you,

Joel Vatsky

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Sent: Monday, August 11, 2003 5:36 PM
Subject: IPSC Low NOx Burner Spec Attachments

> Gentlemen,
>

> Please find the attached .pdf drawings that are a part of the Low NOx
> burner specification that you will soon be receiving. The drawings are
> intended to show the windbox and boiler arrangements. These are

> attachments 6 and 7 of the spec.

>

> Phil Hailes

>

CC: "Larson, Tarkel" <tarkel@advancedburner.com>, "Ferrara, Sal N." <Sal@advancedburner.com>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 8/29/2003 2:55:46 PM

I tried sending this with the photo, but it's an 8MB file so I've deleted it. I'll try sending the photo separately.

But if you will go to our website, advancedburner.com, you will see it in the low NOx burner section. We show two designs there, one has a rotating sleeve damper that we no longer use and the other, further back in the test, shows the Pirkey burner.

Phil:

This is in response to your conversation with Sal a little while ago.

I have attached a Power Point file that shows a side elevation of the burner for the 700MW Pirkey #1 unit's (owned by AEP/SWEPCo in Texas) burner as well as a photo of a complete assembly.

Also attached are two drawings for that job:

The burner field erection dwg shows the relationship between the various parts.

The air register throat assy dwg shows the register spin vanes and linkages in more detail.

The only difference, mechanically, between this burner and our latest version is that the inner fixed vane swirler was axially adjustable on Pirkey but we determined that we do not need that function to achieve the optimum performance of our burner. Consequently, the inner swirler is not adjustable on burners we have been offering recently. We have the non-movable design on a 700 MW unit with JEA in Florida and the burner functions fine; firing a mixture of 80% Colombian coal and 20% petcoke (much more difficult fuel than yours).

As far as making the throat assembly out of ceramic, we do not think this is a good idea. The tiles are fragile and can fracture due to impact, temperature gradient and mishandling. We have chosen SS castings because of their resistance to warping under high temperature and temp gradient conditions.

We have been using stainless steel castings made of the same material that our nozzles are. The longest they have been in service is at the Welsh #1 unit since 1999, also owned by AEP/SWEPCo in Texas, which is a 560 MW B&W boiler. Eight were also installed at Pirkey a year later (all 56 were done in fall '01). The throat castings look like new with no evidence of warping or cracking, or corrosion. They withstand the temperature and atmosphere just fine.

We also have them installed on two other B&W units, firing bituminous coal, in Ky and there are no problems with those either.

If you have any additional questions or need more detail please contact Sal.

Joel Vatsky

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 8/29/2003 3:13:26 PM

Phil: these are two photos of the Pirkey burner. One is of the burner front and one is the complete module before leaving the shop(excuse the mess around it).

IP7_030667

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/1/2003 8:04:01 AM
Subject: ABT Burner Proposal

Phil:

I wanted to add some information regarding the operation of the registers we ahve designed for your unit.

The designs we have used for other B&W boilers, such shown on the Pirkey dwgs we sent on Friday, use manual push-pull handles to move the sleeve damper(one handle0 and the outer adjustable spin vanes' bull ring(two handles). These are satisfactory for those registers, which are smaller than the one we have designed for you.

Because your's is larger and heavier, we will use ratchet type actuators to provide mechanical advantage for moving the sleeve damper and the spin vane ring.

These adjustments are normally only made when optimizing the burners and then remain in the same position for long periods of time. We have had good success in the long-term reliabilty of these devices.

I trust that the dwgs and information we sent on Friday plus this description will adequately present the operational considerations we have taken into account in designing these burners.

Joel Vatsky

CC: "Ferrara, Sal N." <Sal@advancedburner.com>, "Onaitis, Chuck" <Chuck@advancedburner.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/2/2003 11:22:15 AM
Subject: Re: Experience List

Phil,

The list incorporated in Section 2.1 of our proposal contains nearly a complete list of our burner installations on large boilers. Attached is a reference list (ABTEXP8_2003.doc) containing all of our large boiler installations. Note that the only additional ones to those listed in our proposal are Homer City Units 1 & 2 and Oklaunion Unit 1. Although we do not have a large customer list, we have several repeat customers, indicating that our performance was successful to the point that those customers came back for additional equipment.

I also attached an electronic version of our proposal as you requested (except I don't have electronic copy of MEI's Installation bid). I am still working on responses to your other questions and will get those to you later today.

regards,
Sal Ferrara

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Cc: <Chuck@advancedburner.com>; <Sal@advancedburner.com>
Sent: Tuesday, September 02, 2003 10:22 AM
Subject: Experience List

> Can you provide a full list of installations of ABT burners in large
> boilers?
>

CC: "joel vatsky" <joel@advancedburner.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/2/2003 3:43:36 PM
Subject: Re: ABT Burner Proposal

Phil,

We have had good success with 309 SS on our burner parts that are directly exposed to furnace radiation, on units having larger burner throats than the IGS Unit. We have not used the 253 MA material in the past however are open to suggestions you may have on using this material on specific components of our burner. The chemistry and temperature resistant properties of the 253 material is similar to 309, so we would not expect much change in longevity under high temperature applications. Our burner fabricator advises that welding and forming of the 253 material is slightly more difficult than 309, however not to the point where it would effect their labor costs. We do not have sufficient information at this point on cost difference between 253 and 309 plate material, but we are investigating this.

In answer to other questions you asked in our phone discussion:

1. Referencing our proposal Section 3.4, our pricing includes the flow modeling and supply of material depicted by the model as being necessary to balance the duct and burner windboxes.
2. Referencing our Proposal Section 6.1, the cost of the construction performance bond would be additional to pricing we provided on the bid document pricing sheet. We estimated the bond price to be \$15,000 based on a bond for 50% of the installation price. The cost would be less if you required a bond for only 10% of the installation price.

I trust this answers all your question. Please let me know if there is anything else.

regards,
Sal

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Cc: <Chuck@advancedburner.com>; <Sal@advancedburner.com>
Sent: Tuesday, September 02, 2003 9:31 AM
Subject: Re: ABT Burner Proposal

> Joel,
>
> In lieu of the 309 SS material, do you have other materials that you
> are willing to manufacture the burners out of? We've had some success
> with RM 253 over 309SS.
>
> Phil
>

CC: "joel vatsky" <joel@advancedburner.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Pat Finlinson" <Pat-F@ipsc.com>
Date: 9/2/2003 4:01:45 PM
Subject: Re: Intermountain Power - Proposal No. Q03013

Pat,

In our telephone discussion today, you indicated that it would be acceptable that we show evidence of insurance up to the "value of the material supply portion of the contract". In this case we would have to increase our Professional Liability policy (PL) to \$2.5 million. Our insurer recently advised us that the additional premium to increase our PL to \$2 million would be \$37,000. I don't have an answer from them yet on increasing it by another \$1/2 million, but I expect the increase will be somewhat linear (approx. another \$20,000). I will let you know as soon as I hear back from our insurer.

regards,
Sal

----- Original Message -----

From: "Pat Finlinson" <Pat-F@ipsc.com>
To: <sal@advancedburner.com>
Cc: "James Nelson" <JIM-N@ipsc.com>; "Phil Hailes" <Phil-H@ipsc.com>
Sent: Tuesday, September 02, 2003 1:41 PM
Subject: Intermountain Power - Proposal No. Q03013

> Mr. Ferrara,
>
> Phil Hailes has asked that I review your comments and objections
> regarding the risk and insurance provisions of our request for bid
> documents. I understand that the contract has not yet been awarded.
> However, knowing where we stand on these important issues with the
> various bidders makes the decision somewhat easier.
>
> Your proposed addition to our limitation of liability is acceptable
> provided you show evidence of insurance up to the value of the contract.
> Please let us know as soon as possible what the additional premium will
> be. This will obviously impact our decision.
>
> We can live with most of your exceptions to our insurance requirements.
> However, evidence of insurance must be provided on our endorsement
> forms. Certificates will not suffice. We can waive this requirement
> only if you provide us with a complete copy of your policy. I have
> attached copies of our forms to this email for your review. Most of the
> major brokers have used our forms with us or with the City of Los
> Angeles. If professional liability coverage is to be added by
> endorsement rather than by a separate policy a copy of the endorsement
> adding that coverage will suffice.
>
> As mentioned above, limits of insurance in either professional
> liability or commercial general liability with a products and completed
> operations component must be raised to at least the contract price.
>
> It will benefit all involved to try and resolve these issues as soon as
> possible. You may contact me directly at 435-864-6567. I look forward
> to hearing from you.
>

IP7_030671

> Pat Finlinson
> Risk & Insurance Analyst
>
>
>

CC: "joel vatsky" <joel@advancedburner.com>, "Phil Hailes" <Phil-H@ipsc.com>, "James Nelson" <JIM-N@ipsc.com>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>, <sal@advancedburner.com>
Date: 9/3/2003 8:57:59 AM
Subject: Re: Guarantee Clarification

Phil:

What we have guaranteed is specified in section 4: NOx, with OFA ports closed, not to exceed 0.33, CO not to exceed 200ppm and no change in LOI provided the conditions of fuel and mill are met.

The NOx levels with 10 and 20% OFA flow are predicted only. We cannot guarantee emissions with someone else's OFA system. Although we would with our OFA system; and possibly lower. But we have not investigated this since you have already purchased the OFA system from others.

However, our predictions with OFA ports open are realistic and the boiler will operate in the range we predict.

Joel Vatsky

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <sal@advancedburner.com>
Cc: <joel@advancedburner.com>
Sent: Wednesday, September 03, 2003 10:02 AM
Subject: Guarantee Clarification

> Please clarify your emission guarantees for me. Specifically, the
> number of mills in operation for each level. .
>
> 1) 7 or 8 Mills, 0% OFA, NOx = .33, CO <200, LOI = no change.
> 2) 7 or 8 mills, 10% OFA, NOx = .29, etc
> 3) 7 or 8 mills, 20% OFA, NOx = .25, etc.
>
>
> As I understand Joel last week, the guarantees apply whether or not it is 7
> or 8 mills in operation.
>
> Thanks
> Phil
>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/3/2003 10:54:46 AM
Subject: Re: Guarantee Clarification

Sorry, I should have reiterated what I mentioned on the phone the other day:

The burners are sized for one mill out to allow continuous operation without excessive velocities, which would occur if we used the all mills in service case as the design point and the unit was then operated for long periods of time with one mill out. One out of 8 mills does not create a significant problem.

The NOx emission guarantee holds with all mills in or one mill out. The NOx is slightly lower when a top mill is out and slightly higher, as compared to all mills in, with a bottom mill out. In the introduction, 1-1, we mentioned one mill out with a NOx range of 0.3 -0.35. The guarantee page lists 0.33 in section 4-4 but does not specify the number of mills (intended to allow one mill out or all mills in).

I understand where the confusion comes from: the guarantee vs predictions and ranges which are provided for information.

Guarantee: 0.33 7 or 8 mills.

Joel

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Sent: Wednesday, September 03, 2003 10:59 AM
Subject: Re: Guarantee Clarification

> Yes. But is this guarantee at 7 mill or 8 mill operation. I believe
> that you are saying 7 mill operation (page 1-1). Correct?
>
> >>> "joel" <joel@advancedburner.com> 9/3/2003 9:03:55 AM >>>
> Phil:
>
> What we have guaranteed is specified in section 4: NOx, with OFA
> ports
> closed, not to exceed 0.33, CO not to exceed 200ppm and no change in
> LOI
> provided the conditions of fuel and mill are met.
>
> The NOx levels with 10 and 20% OFA flow are predicted only. We cannot
> guarantee emissions with someone else's OFA system. Although we would
> with
> our OFA system; and possibly lower. But we have not investigated this
> since
> you have already purchased the OFA system from others.
>
> However, our predictions with OFA ports open are realistic and the
> boiler
> will operate in the range we predict.

>
> Joel Vatsky
>
>
> ----- Original Message -----
> From: "Phil Hailes" <Phil-H@ipsc.com>
> To: <sal@advancedburner.com>
> Cc: <joel@advancedburner.com>
> Sent: Wednesday, September 03, 2003 10:02 AM
> Subject: Guarantee Clarification
>
>
> > Please clarify your emission guarantees for me. Specifically, the
> > number of mills in operation for each level. .
> >
> > 1) 7 or 8 Mills, 0% OFA, NOx = .33, CO <200, LOI = no change.
> > 2) 7 or 8 mills, 10% OFA, NOx = .29, etc
> > 3) 7 or 8 mills, 20% OFA, NOx = .25, etc.
> >
> >
> > As I under Joel last week, the guarantees apply whether or not it is
> > 7
> > or 8 mills in operation.
> >
> > Thanks
> > Phil
> >
>
>

CC: "Ferrara, Sal N." <Sal@advancedburner.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Pat Finlinson" <Pat-F@ipsc.com>
Date: 9/3/2003 11:39:36 AM
Subject: Re: Intermountain Power - Proposal No. Q03013

Pat,

Our insurer advised that the total additional premium to increase our PL limit to \$2.5 million would be \$60,000. Note that since you would accept most of our exceptions to IPSC insurance requirements, we would modify your emailed forms accordingly, prior to submitting them to show evidence. Please let me know if you have other questions.

regards,

Sal

----- Original Message -----

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Pat Finlinson" <Pat-F@ipsc.com>
Cc: "joel vatsky" <joel@advancedburner.com>; "Phil Hailes" <Phil-H@ipsc.com>; "James Nelson" <JIM-N@ipsc.com>
Sent: Tuesday, September 02, 2003 6:09 PM
Subject: Re: Intermountain Power - Proposal No. Q03013

> Pat,

> In our telephone discussion today, you indicated that it would be acceptable

> that we show evidence of insurance up to the "value of the material supply

> portion of the contract". In this case we would have to increase our

> Professional Liability policy (PL) to \$2.5 million. Our insurer recently

> advised us that the additional premium to increase our PL to \$2 million

> would be \$37,000. I don't have an answer from them yet on increasing it by

> another \$1/2 million, but I expect the increase will be somewhat linear

> (approx. another \$20,000). I will let you know as soon as I hear back from

> our insurer.

> regards,

> Sal

> ----- Original Message -----

> From: "Pat Finlinson" <Pat-F@ipsc.com>

> To: <sal@advancedburner.com>

> Cc: "James Nelson" <JIM-N@ipsc.com>; "Phil Hailes" <Phil-H@ipsc.com>

> Sent: Tuesday, September 02, 2003 1:41 PM

> Subject: Intermountain Power - Proposal No. Q03013

>

>

> > Mr. Ferrara,

> >

> > Phil Hailes has asked that I review your comments and objections

> > regarding the risk and insurance provisions of our request for bid

> > documents. I understand that the contract has not yet been awarded.

> > However, knowing where we stand on these important issues with the

> > various bidders makes the decision somewhat easier.

> >

> > Your proposed addition to our limitation of liability is acceptable

> > provided you show evidence of insurance up to the value of the contract.

> > Please let us know as soon as possible what the additional premium will

> > be. This will obviously impact our decision.

> >

> > We can live with most of your exceptions to our insurance requirements.
> > However, evidence of insurance must be provided on our endorsement
> > forms. Certificates will not suffice. We can waive this requirement
> > only if you provide us with a complete copy of your policy. I have
> > attached copies of our forms to this email for your review. Most of the
> > major brokers have used our forms with us or with the City of Los
> > Angeles. If professional liability coverage is to be added by
> > endorsement rather than by a separate policy a copy of the endorsement
> > adding that coverage will suffice.
> >
> > As mentioned above, limits of insurance in either professional
> > liability or commercial general liability with a products and completed
> > operations component must be raised to at least the contract price.
> >
> > It will benefit all involved to try and resolve these issues as soon as
> > possible. You may contact me directly at 435-864-6567. I look forward
> > to hearing from you.
> >
> > Pat Finlinson
> > Risk & Insurance Analyst
> >
> >
> >
> >
>

CC: "James Nelson" <JIM-N@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>, "joel vatsky"
<joel@advancedburner.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/3/2003 2:39:52 PM
Subject: Re: Exception.....6.8 Div F2,

Phil,

Your spec. paragraph, Article 5e (Section 6.8 Division F2.....), can remain as written. We were clarifying what we intend on supplying to meet your requirement. We are just unsure of the terminology "cold junction block" however we believe we are in compliance with this. If not, we would supply whatever you need on thermocouple termination interface.

Also, I attached additional clarifications to our proposal Section 6.4 in answer to your telephone questions from earlier today. Please let me know if there is anything else you need.

regards,

Sal

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <sal@advancedburner.com>
Sent: Wednesday, September 03, 2003 3:04 PM
Subject: Exception.....6.8 Div F2,

> Sal,

>

> When you sent your hard copy book, you did not include page 4 of
> section 6. We discovered the error when reviewing the electronic
> version that you had recently sent to me.

>

> That being said, your exception to Article 5e (Section 6.8 Division
> F2.....), isn't workable to us. We need to leave the paragraph as-is.
> We need to have the temperature signals run to a cold junction block out
> side the windbox. Perhaps you're not disagreeing with our statement,
> but merely adding to it.

>

> Comments?

>

> Phil

>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/4/2003 9:35:06 AM
Subject: Re: test gram

I hope this works!

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <sal@advancedburner.com>
Cc: "Pat Finlinson" <Pat-F@ipsc.com>
Sent: Thursday, September 04, 2003 11:27 AM
Subject: test gram

> Sal has not been able to send us e-mails. Some where in the system he
> is getting it bounced back. This is a test memo.
>
> Sal, hit "reply to all" to that Pat will also get your reply.
>

CC: "Pat Finlinson" <Pat-F@ipsc.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Pat Finlinson" <Pat-F@ipsc.com>
Date: 9/4/2003 12:41:47 PM
Subject: Re: Intermountain Power Q03013

Pat,

After discussion on the revised insurances requirements with our insurer, based on clarifications in our proposal and recent discussions with you on our limits, "SPECIAL CONDITIONS, 6b, Commercial General Liability", should be revised further as I shown on attached.

The standard IPSC endorsement forms you provided are broader than our policy allows and would require considerable modification to make them agree with these revised requirements. We would prefer that IPSC waive the requirement to show evidence on your forms, as suggested in your 9/2/03 email, and we would provide a complete copy of our policy (excluding premium pages).

Please let me know if this is acceptable.

regards,
Sal

----- Original Message -----

From: "Pat Finlinson" <Pat-F@ipsc.com>
To: "<"Sal Ferrara"" <sal@advancedburner.com>
Cc: "Phil Hailes" <Phil-H@ipsc.com>
Sent: Wednesday, September 03, 2003 2:19 PM
Subject: Intermountain Power Q03013

> Mr. Ferrara,
>
> Thank you for the information regarding the increase in premium. I had
> our purchasing department incorporate your exceptions, as altered by our
> conversation, into the agreement. I am attaching the insurance
> provisions for you to review. Please let me know if they are
> acceptable. Again, thank you for your efforts.
>
> Pat Finlinson
>

CC: "Phil Hailes" <Phil-H@ipsc.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Pat Finlinson" <Pat-F@ipsc.com>
Date: 9/4/2003 3:11:25 PM
Subject: Re: Intermountain Power Q03013

Thank you Pat for working with us on this. We have reached agreement on the Insurance requirements.

Sal

----- Original Message -----

From: "Pat Finlinson" <Pat-F@ipsc.com>
To: <sal@advancedburner.com>
Cc: "Phil Hailes" <Phil-H@ipsc.com>
Sent: Thursday, September 04, 2003 3:07 PM
Subject: Re: Intermountain Power Q03013

> Sal,

>

> Thank you for the response. Your requests are acceptable. I have
> asked our contract people to replace the last sentence in paragraph 6b
> with the following:

>

> "Evidence of such coverage shall be on IPSC's Additional Insured
> Endorsement Form, on an endorsement of the policy acceptable to IPSC, or
> a complete copy of the coverage and exclusions portions of the policy.
> The evidence of coverage should provide for the following:"

>

> I also changed the requirement in the workers' compensation paragraph
> from our special endorsement to a certificate. Given the scope of the
> project as I understand it a certificate of WC coverage will be more
> than adequate. Again, thanks for your input. We look forward to
> working with you.

>

> pf

>

> >>> "Sal Ferrara" <sal@advancedburner.com> 9/4/2003 12:46:55 PM >>>

> Pat,

> After discussion on the revised insurances requirements with our
> insurer,
> based on clarifications in our proposal and recent discussions with you
> on
> our limits, "SPECIAL CONDITIONS, 6b, Commercial General Liability",
> should
> be revised further as I shown on attached.
> The standard IPSC endorsement forms you provided are broader than our
> policy
> allows and would require considerable modification to make them agree
> with
> these revised requirements. We would prefer that IPSC waive the
> requirement
> to show evidence on your forms, as suggested in your 9/2/03 email, and
> we
> would provide a complete copy of our policy (excluding premium pages).
>
> Please let me know if this is acceptable.
> regards,

> Sal

>

> ----- Original Message -----

> From: "Pat Finlinson" <Pat-F@ipsc.com>

> To: "<Sal Ferrara"" <sal@advancedburner.com>

> Cc: "Phil Hailes" <Phil-H@ipsc.com>

> Sent: Wednesday, September 03, 2003 2:19 PM

> Subject: Intermountain Power Q03013

>

>

> > Mr. Ferrara,

> >

> > Thank you for the information regarding the increase in premium. I

> had

> > our purchasing department incorporate your exceptions, as altered by

> our

> > conversation, into the agreement. I am attaching the insurance

> > provisions for you to review. Please let me know if they are

> > acceptable. Again, thank you for your efforts.

> >

> > Pat Finlinson

> >

>

CC: "Phil Hailes" <Phil-H@ipsc.com>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/10/2003 1:10:43 PM

Phil:

We need ASAP the following:

What is the primary air flow per mill with the boiler at full load with 7 mills in service? This value will set our nozzle sizing..

Joel Vatsky

CC: "Onaitis, Chuck" <Chuck@advancedburner.com>, "Ferrara, Sal N." <Sal@advancedburner.com>

IP7_030683

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/11/2003 12:02:34 PM
Subject: Re: PA Mass Flow

Phil: this number is not correct. PA flow for mills of this size is in the 100,000's lb.hr per mill.

It is not an approximate value we need; but the actual quantity under the specified condition.

Please recheck this.

Joel

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Sent: Thursday, September 11, 2003 12:25 PM
Subject: PA Mass Flow

> At 950 MW with 7 mills, the PA mass flow is approximately 3,500 lbs/hr
> per mill.

>

> >>> "joel" <joel@advancedburner.com> 9/10/2003 1:16:18 PM >>>

> Phil:

>

> We need ASAP the following:

>

> What is the primary air flow per mill with the boiler at full load with
> 7 mills in service? This value will set our nozzle sizing..

>

>

>

> Joel Vatsky

>

>

>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/11/2003 12:52:32 PM
Subject: Re: PA Mass Flow

OK: You initially had lb/hr I did know if that was a typo or just the wrong number.

We'll use 210,00 lb/hr as the design flow for the fuel injector sizing.

Thanks,

When do you need the dwg info you asked for?

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Sent: Thursday, September 11, 2003 2:04 PM
Subject: Re: PA Mass Flow

> 3500 lbs/min is the average rate that Unit 1 at 950 MW is running at
> today with 7 mills. What specified condition are you requesting?

>

> >>> "joel" <joel@advancedburner.com> 9/11/2003 12:08:23 PM >>>

> Phil: this number is not correct. PA flow for mills of this size is in
> the

> 100,000's lb.hr per mill.

>

> It is not an approximate value we need; but the actual quantity under
> the

> specified condition.

>

> Please recheck this.

>

> Joel

>

>

> ----- Original Message -----

> From: "Phil Hailes" <Phil-H@ipsc.com>

> To: <joel@advancedburner.com>

> Sent: Thursday, September 11, 2003 12:25 PM

> Subject: PA Mass Flow

>

>

> > At 950 MW with 7 mills, the PA mass flow is approximately 3,500
> lbs/hr

> > per mill.

> >

> > >>> "joel" <joel@advancedburner.com> 9/10/2003 1:16:18 PM >>>

> > Phil:

> >

> > We need ASAP the following:

> >

> > What is the primary air flow per mill with the boiler at full load

> with
> > 7 mills in service? This value will set our nozzle sizing..
> >
> >
> >
> > Joel Vatsky
> >
> >
> >
>
>

CC: "Onaitis, Chuck" <Chuck@advancedburner.com>, "Ferrara, Sal N."
<Sal@advancedburner.com>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/11/2003 1:57:14 PM
Subject: Re: PA Mass Flow

Ok you got me. My hands are not keeping up with my brain today!
210,000.

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Sent: Thursday, September 11, 2003 2:54 PM
Subject: Re: PA Mass Flow

> Speaking of typo's.....21000 lb/hr is not correct for mills of this
> size.
>
> >>> "joel" <joel@advancedburner.com> 9/11/2003 12:58:07 PM >>>
> OK: You initially had lb/hr I did know if that was a typo or just the
> wrong
> number.

>
> We'll use 210,00 lb/hr as the design flow for the fuel injector
> sizing.

>
> Thanks,

>
> When do you need the dwg info you asked for?

>
> ----- Original Message -----

> From: "Phil Hailes" <Phil-H@ipsc.com>
> To: <joel@advancedburner.com>
> Sent: Thursday, September 11, 2003 2:04 PM
> Subject: Re: PA Mass Flow

>
>
> > 3500 lbs/min is the average rate that Unit 1 at 950 MW is running
> at

> > today with 7 mills. What specified condition are you requesting?

> > >>> "joel" <joel@advancedburner.com> 9/11/2003 12:08:23 PM >>>

> > Phil: this number is not correct. PA flow for mills of this size is
> in

> > the

> > 100,000's lb.hr per mill.

> >
> > It is not an approximate value we need; but the actual quantity
> under

> > the

> > specified condition.

> >

> > Please recheck this.

> >

> > Joel

> >

> >

> > ----- Original Message -----

> > From: "Phil Hailes" <Phil-H@ipsc.com>

> > To: <joel@advancedburner.com>

> > Sent: Thursday, September 11, 2003 12:25 PM

> > Subject: PA Mass Flow

> >

> >

> > > At 950 MW with 7 mills, the PA mass flow is approximately 3,500

> > lbs/hr

> > > per mill.

> > >

> > > > "joel" <joel@advancedburner.com> 9/10/2003 1:16:18 PM >>>

> > > Phil:

> > >

> > > We need ASAP the following:

> > >

> > > What is the primary air flow per mill with the boiler at full load

> > with

> > > 7 mills in service? This value will set our nozzle sizing..

> > >

> > >

> > >

> > > Joel Vatsky

> > >

> > >

> > >

> >

> >

>

>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/11/2003 2:16:34 PM
Subject: Re: Drawing Request.

Phil:

Chuck I going to try to get it out tonight.
but we do not have exactly what you need so he has to modify the proposal
dwg.

Joel

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Sent: Thursday, September 11, 2003 3:00 PM
Subject: Drawing Request.

> Joel,
>
> I actually need it today, but as soon as possible would help. Any
> other "introductory" info of a visual nature would help. But
> specifically, materials-used and general dimensions of the burners.
>
> Thanks.
>
> >>> "joel" <joel@advancedburner.com> 9/11/2003 12:58:07 PM >>>
> OK: You initially had lb/hr I did know if that was a typo or just the
> wrong
> number.
>
> We'll use 210,00 lb/hr as the design flow for the fuel injector
> sizing.
>
> Thanks,
>
> When do you need the dwg info you asked for?
>
>

> ----- Original Message -----

> From: "Phil Hailes" <Phil-H@ipsc.com>
> To: <joel@advancedburner.com>
> Sent: Thursday, September 11, 2003 2:04 PM
> Subject: Re: PA Mass Flow
>
>

> > 3500 lbs/min is the average rate that Unit 1 at 950 MW is running
> at
> > today with 7 mills. What specified condition are you requesting?
> >
> > >>> "joel" <joel@advancedburner.com> 9/11/2003 12:08:23 PM >>>
> > Phil: this number is not correct. PA flow for mills of this size is
> in

> > the
> > 100,000's lb.hr per mill.
> >
> > It is not an approximate value we need; but the actual quantity
> under
> > the
> > specified condition.
> >
> > Please recheck this.
> >
> > Joel
> >
> >
> > ----- Original Message -----
> > From: "Phil Hailes" <Phil-H@ipsc.com>
> > To: <joel@advancedburner.com>
> > Sent: Thursday, September 11, 2003 12:25 PM
> > Subject: PA Mass Flow
> >
> >
> > > At 950 MW with 7 mills, the PA mass flow is approximately 3,500
> > lbs/hr
> > > per mill.
> > >
> > > > "joel" <joel@advancedburner.com> 9/10/2003 1:16:18 PM >>>
> > > Phil:
> > >
> > > We need ASAP the following:
> > >
> > > What is the primary air flow per mill with the boiler at full load
> > with
> > > 7 mills in service? This value will set our nozzle sizing..
> > >
> > >
> > >
> > > Joel Vatsky
> > >
> > >
> > >
> >
> >
>
>

CC: "Onaitis, Chuck" <Chuck@advancedburner.com>

From: "Chuck Onaitis" <chuck@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/11/2003 2:36:45 PM
Subject: Information Request

Phil:

Attached is a .dwg file of our proposal drawing with additional dimensions and notes on materials.

This arrangement has not been updated to include the separate turning vane Dutchman in the fuel injector. It still shows the turning vanes permanently installed in the elbow.

The only assembly that is removable is the fuel injector. The register is welded in place.

Any questions, please give me a call.

Chuck Onaitis
Manager, Engineering Operations

CC: "Joel Vatskey" <Joel@advancedburner.com>, "Sal Ferrara"
<sal@advancedburner.com>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/11/2003 3:17:37 PM
Subject: Re: Information Request

Not this time. We're getting a proposal out and will be here for another hour or two.

But, even if we weren't you would still have the dwg.

We are really looking forward to working with you on this. Hope to come out for a visit soon.

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <chuck@advancedburner.com>
Cc: <Joel@advancedburner.com>; <sal@advancedburner.com>
Sent: Thursday, September 11, 2003 4:59 PM
Subject: Re: Information Request

> This drawing will work just fine. Thank you for the extra effort.
> Sorry if you stayed late because of me.
>
>
> >>> "Chuck Onaitis" <chuck@advancedburner.com> 9/11/2003 2:33:26 PM
> >>>
> Phil:
>
> Attached is a .dwg file of our proposal drawing with additional
> dimensions and notes on materials.
>
> This arrangement has not been updated to include the separate turning
> vane Dutchman in the fuel injector. It still shows the turning vanes
> permanently installed in the elbow.
>
> The only assembly that is removable is the fuel injector. The register
> is welded in place.
>
> Any questions, please give me a call.
>
> Chuck Onaitis
> Manager, Engineering Operations
>

From: "Chuck Onaitis" <chuck@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/11/2003 4:25:09 PM
Subject: Re: Information Request

No problem, actually I was able to finish before 5-our time.

I just started on the contract check, and need one piece of information. What is the diameter of the hole in the windbox. There is a dimension line for this diameter, given on the burner drawings provided in the spec, but no dimension.

I'd like to finish the check tomorrow and turn it over to my drafter for detailing early next week.

Chuck Onaitis

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <chuck@advancedburner.com>
Cc: <Joel@advancedburner.com>; <sal@advancedburner.com>
Sent: Thursday, September 11, 2003 4:59 PM
Subject: Re: Information Request

> This drawing will work just fine. Thank you for the extra effort.
> Sorry if you stayed late because of me.
>
>
> >>> "Chuck Onaitis" <chuck@advancedburner.com> 9/11/2003 2:33:26 PM
> >>>
> Phil:
>
> Attached is a .dwg file of our proposal drawing with additional
> dimensions and notes on materials.
>
> This arrangement has not been updated to include the separate turning
> vane Dutchman in the fuel injector. It still shows the turning vanes
> permanently installed in the elbow.
>
> The only assembly that is removable is the fuel injector. The register
> is welded in place.
>
> Any questions, please give me a call.
>
> Chuck Onaitis
> Manager, Engineering Operations
>

CC: <Joel@advancedburner.com>, <sal@advancedburner.com>

From: "Chuck Onaitis" <chuck@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/12/2003 12:51:49 PM
Subject: PA Questions

Phil:

What was the coal flow that correspondS with the 3500 lb/min Primary Air flow? Also, if possible, the main steam flow.

Chuck Onaitis

CC: "Joel Vatskey" <Joel@advancedburner.com>, "Sal Ferrara" <sal@advancedburner.com>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/16/2003 2:30:03 PM

Phil:

I have been trying to talk to James Nelson, but I have not received a return call.

When we agreed to change the payment schedule to eliminate the payment on order, and substitute the first payment upon receipt to drawings, we did not realize that our insurance company was going to invoice us for 50% of the \$60,000.00 additional premium.

I would like to invoice IPSC for that amount, but need you to put it in your system so that it will be paid.

Can you discuss this with James and let me know if there is any problem with doing this?

Appreciate it.

Joel Vatsky

CC: "Ferrara, Sal N." <Sal@advancedburner.com>

IP7_030695

From: "Chuck Onaitis" <chuck@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/18/2003 9:01:43 AM
Subject: Re: PA Questions

Phil:

No I didn't.

1 I need the opening in the windbox. The B&W burner Arrangement drawing you sent us had several dimensions wiped out, and the windbox opening size was one of them. I want to make sure that we can insert the burner module into the windbox without any trimming. I used the Register OD as the max size for our burner sleeve damper, but I would like to verify this.

2 You said the Primary air flow was 3500 lb/min. what is the corresponding coal flow, and the main steam flow?

Chuck Onaitis

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <chuck@advancedburner.com>
Sent: Wednesday, September 17, 2003 9:08 AM
Subject: Re: PA Questions

> Sorry that I didn't get back to you sooner. Did you already get what
> you needed?
>
> >>> "Chuck Onaitis" <chuck@advancedburner.com> 9/12/2003 12:48:19 PM
> >>>
> Phil:
>
> What was the coal flow that correspondS with the 3500 lb/min Primary
> Air flow? Also, if possible, the main steam flow.
>
> Chuck Onaitis
>

CC: "Sal Ferrara" <sal@advancedburner.com>

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/18/2003 12:48:33 PM
Subject: Re: Re:

Phil:

Anything new on this?

Joel

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Sent: Tuesday, September 16, 2003 4:31 PM
Subject: Re:

> I'm reviewing this request and the notes that you attached to the
> contract.
>
> Phil
>
> >>> "joel" <joel@advancedburner.com> 9/16/2003 2:36:46 PM >>>
> Phil:
>
> I have been trying to talk to James Nelson, but I have not received a
> return call.
>
> When we agreed to change the payment schedule to eliminate the payment
> on order, and substitute the first payment upon receipt to drawings, we
> did not realize that our insurance company was going to invoice us for
> 50% of the \$60,000.00 additional premium.
>
> I would like to invoice IPSC for that amount, but need you to put it in
> your system so that it will be paid.
>
> Can you discuss this with James and let me know if there is any problem
> with doing this?
>
> Appreciate it.
>
> Joel Vatsky
>

IP7_030697

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/22/2003 2:46:27 PM
Subject: Re: Insurance Premium

Thanks, Phil. Sal will send it to you.

Joel

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Cc: "James Nelson" <JIM-N@ipsc.com>
Sent: Monday, September 22, 2003 3:06 PM
Subject: Insurance Premium

> Joel,
>
> I believe that the best way to handle this, if for you to submit an
> invoice to us. We then authorize payment against the contract.
>
> >>> "joel" <joel@advancedburner.com> 9/18/2003 12:54:47 PM >>>
> Phil:
>
> Anything new on this?
>
> Joel
>
>
> ----- Original Message -----
> From: "Phil Hailes" <Phil-H@ipsc.com>
> To: <joel@advancedburner.com>
> Sent: Tuesday, September 16, 2003 4:31 PM
> Subject: Re:
>
>
> > I'm reviewing this request and the notes that you attached to the
> > contract.
> >
> > Phil
> >
> > >>> "joel" <joel@advancedburner.com> 9/16/2003 2:36:46 PM >>>
> > Phil:
> >
> > I have been trying to talk to James Nelson, but I have not received
> > a
> > return call.
> >
> > When we agreed to change the payment schedule to eliminate the
> > payment
> > on order, and substitute the first payment upon receipt to drawings,
> > we
> > did not realize that our insurance company was going to invoice us

IP7_030698

> for
> > 50% of the \$60,000.00 additional premium.
> >
> > I would like to invoice IPSC for that amount, but need you to put it
> in
> > your system so that it will be paid.
> >
> > Can you discuss this with James and let me know if there is any
> problem
> > with doing this?
> >
> > Appreciate it.
> >
> > Joel Vatsky
> >
>
>

CC: "James Nelson" <JIM-N@ipsc.com>

IP7_030699

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/23/2003 11:54:39 AM
Subject: Re: Insurance Premium

Phil:

We normally do not receive any acknowledgement of payment. We receive an invoice and send in the check. The only receipt we get is the cancelled check.

This payment is due on 10/15. I would like to invoice you now for that payment. The insurance company is going to add the rest to our scheduled premium payments, so you would not see it anyway. I do not know how to address this and hope this explanation is acceptable.

Joel

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>
Sent: Tuesday, September 23, 2003 10:14 AM
Subject: Re: Insurance Premium

> Be sure to include proper documentation from the insurance provider
> showing payment etc.

>

> >>> "joel" <joel@advancedburner.com> 9/22/2003 2:52:24 PM >>>
> Thanks, Phil. Sal will send it to you.

>

> Joel

>

>

>

> ----- Original Message -----

> From: "Phil Hailes" <Phil-H@ipsc.com>
> To: <joel@advancedburner.com>
> Cc: "James Nelson" <JIM-N@ipsc.com>
> Sent: Monday, September 22, 2003 3:06 PM
> Subject: Insurance Premium

>

>

> > Joel,

> >

> > I believe that the best way to handle this, if for you to submit an
> > invoice to us. We then authorize payment against the contract.

> >

> > >>> "joel" <joel@advancedburner.com> 9/18/2003 12:54:47 PM >>>
> > Phil:

> >

> > Anything new on this?

> >

IP7_030700

> > Joel
> >
> >
> > ----- Original Message -----
> > From: "Phil Hailes" <Phil-H@ipsc.com>
> > To: <joel@advancedburner.com>
> > Sent: Tuesday, September 16, 2003 4:31 PM
> > Subject: Re:
> >
> >
> > > I'm reviewing this request and the notes that you attached to the
> > > contract.
> > >
> > > Phil
> > >
> > >>> "joel" <joel@advancedburner.com> 9/16/2003 2:36:46 PM >>>
> > > Phil:
> > >
> > > I have been trying to talk to James Nelson, but I have not
> > > received
> > > a
> > > return call.
> > >
> > > When we agreed to change the payment schedule to eliminate the
> > > payment
> > > on order, and substitute the first payment upon receipt to
> > > drawings,
> > > we
> > > did not realize that our insurance company was going to invoice us
> > > for
> > > 50% of the \$60,000.00 additional premium.
> > >
> > > I would like to invoice IPSC for that amount, but need you to put
> > > it
> > > in
> > > your system so that it will be paid.
> > >
> > > Can you discuss this with James and let me know if there is any
> > > problem
> > > with doing this?
> > >
> > > Appreciate it.
> > >
> > > Joel Vatsky
> > >
> > >
> > >
> > >
> > >
> > >

CC: "Ferrara, Sal N." <Sal@advancedburner.com>

IP7_030701

From: "joel" <joel@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>, <sal@advancedburner.com>
Date: 9/30/2003 1:47:03 PM
Subject: Re: Installation Package for IPP

Phil:

Sal is the project manager for the job, but I'll answer the question since I saw it first.

No we are not now in a position to supply this kind of information. It will take approximately 4-5 weeks before we would have an arrangement drawing with erection notes.

Joel Vatsky

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <joel@advancedburner.com>; <sal@advancedburner.com>
Sent: Tuesday, September 30, 2003 3:21 PM
Subject: Installation Package for IPP

> I don't know who I should address this issue to, but I would like a
> package of drawings, etc that the installation contractor would need.
>
> I need this to provide adequate information to all the parties who are
> interested in bidding on the installation of your burners.
>
> During the upcoming outage, we will be installing air heater baskets,
> new OFA system, and of course your burners. We would like to bid this
> as a group of work.
>
> Are you in a position to supply this?
>
> Phil
>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Tim Bodemann" <bodemann@easterninstruments.com>, "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/1/2003 11:35:19 AM
Subject: Re: IPSC questions

IPSC questions Jerry/Tim,
IPSC should investigate the amount of SA temperature fluctuation occurring over the boiler's control range. Knowing this, the maximum inaccuracy introduced into the flow measurement, utilizing the DPU, can be determined by EI. With the DPU transmitter, a fixed temperature would be programmed into the transmitter for the compensation. The temperature used for this would be from the middle of the range to minimize this inaccuracy, i.e. if temperature fluctuates between 600-700 deg then 650 deg. would be used for the compensation giving maximum error being introduced by the 50 deg delta. I used EI's price for the DPU transmitter in our offer, instead of the DPS price with integral temperature element on every pitot, since I do not expect that the SA temperature fluctuations will be significant enough to matter in the measurement.

regards,

Sal Ferrara

----- Original Message -----

From: Tim Bodemann

To: Jerry Finlinson

Cc: Jim Knapp ; joel@advancedburner.com ; sal@advancedburner.com ; JIM-N@ipsc.com ; Phil-H@ipsc.com ; AARON-N@ipsc.com ; BILL-M@ipsc.com ; Garry-C@ipsc.com

Sent: Wednesday, October 01, 2003 12:35 AM

Subject: RE: IPSC questions

Jerry,

Yes, I too think we got alot accomplished during our phone call today. As for the salesmanship.....well.....I just think I know our product and capabilities real well.....the tough part is to try to convey that message (capabilities) as accurately and concise as possible....so with that said, I thank you for your complement!

Our Technical Director, our Engineering Manager, and I look forward to our conference call with you and your people on Thursday at 9:00am Mountain Time.

To answer your questions (and we will re-address these questions during the conference call):

1) Our spec sheet states 700F and this number is conservative. We provide pitots that span 20' duct cross-sections, with a safety factor of 4 on tensile strength at that temperature. For your application we will be installing 16" VAP Pitots, capable of withstanding 900+F with a safety factor of 2 on tensile strength.

2) Our VAP Pitots are repeatable and as stated during our telephone conversation today, we will guarantee accuracy to match within 1 to 1 ½ % of the "primaries" (the NIST traceable nozzles) within our AMCA/ANSI airflow test stand. CFD Modeling is a necessity on this project. AMCA/ANSI airflow test

stand (wind tunnel) testing of the burner will be provided if desired.

3) Purging. Our continuous purge (if you would like to utilize that option that we will provide within our system at your request), provides positive pressure within the dP sensing chambers. The flow rate of continuous purge is so low that it does not affect our biasing. Even if the balance in the purge was skewed 100%, it would only affect our dP by less than 1 to 2% (1 to 2% error in a worst case scenario). I would like our Technical Director to re-emphasize during our conference call the technology behind our "non-plugging VAP/PA Pitot design and why it has been successfully installed in heavy particulate applications.

4) Yes, we can provide what you want within a pressure/temperature (density) compensated transmitter (our DPS). We have quoted this option to ABT...we will discuss this with ABT so they can forward onto you (if not already) the cost associated with this option.

Please see the attached example of our engineered solution to measuring airflow within a short duct run. This is the *Midwest Gen Homer City* project where we are replacing a recently installed competitor's \$250K primary flow measurement system, which never worked from the first day. Like your burner, this duct work had no straight duct run. Again, we take an approach not to just stick pitots into a duct and assume that it will react similar to another duct configuration...hence the need for the CFD modeling as good engineering practice upfront...prior to cutting metal. Please contact Russ Wingard from Homer City at 724-479-6265. Though we have shipped the solution and they will be installing the equipment in November, Russ/Homer City is very excited about our technology and approach to there measurement issue. We are looking forward to writing a white paper on the project and presenting it during the next Power Gen.

Also attached is a reference paper on the "Analysis of a Cylindrical Pitot". This helped explain for me on why the fechheimer pitot works sometimes and why it doesn't work other times. A must for reading!

Again, thank you for your time and we look forward to our teleconference and a successful installation.

Best Regard,

Tim

-----Original Message-----

From: Jerry Finlinson

Sent: Tue 9/30/2003 7:30 PM

To: Tim Bodemann

Cc: Jim Knapp

IP7_030704

Subject: IPSC questions

Tim,

I was good to visit with you today, you are a good salesman.

We still have some concerns that you need to convince us of.

1. Can the aluminum material handle the temperature. Your spec sheet says 700F.

What kind of warranty or remedy if it fails?

2. What is your guaranteed accuracy? Can you guarantee 3% installed and how to verify that?

We'd like to see you do CFD and wind tunnel testing of a mockup windbox, similar to what Air Monitor has done.

3. Purging - we don't really like continuous purge, we've had trouble with ours in the past. How is your's better, if not necessary why have it? Explain why particles don't impinge in holes and cause eventual plugging. Several guys have problems with this claim.

4. We'd like to see the DPS transmitter with temperature and pressure correction. You could have one thermocouple on each end of the windbox and use it for 3 transmitters. So that would be 16 thermocouples all together. Does your baseline price include that? If not then have ABT include the full complement on the baseline price.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

CC: "Jim Knapp" <JIM-KNAPP@ipsc.com>, <joel@advancedburner.com>, <JIM-N@ipsc.com>, <Phil-H@ipsc.com>, <AARON-N@ipsc.com>, <BILL-M@ipsc.com>, <Garry-C@ipsc.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Jim Nelson" <JIM-N@ipsc.com>
Date: 10/6/2003 12:53:16 PM
Subject: Contract 04-45606, IPP Unit 2 Low NOx Burners

Jim,
Please let me know who I should be corresponding with on this contract. We have several open questions that need answers ASAP. The questions are contained in my letter 9/30/03 letter (attached). I will be glad to clarify any of these questions if you are unsure of the information we are asking for.
Note to clarify our question no. 6, for the "tip setback" we need to know what the existing burner throat depth is.
regards,
Sal

CC: "Phil Hailes" <Phil-H@ipsc.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 10/6/2003 2:15:27 PM
Subject: IPSC Contract 04-45606, U2 Low NOx Burners

Phil,
Thank you for your fax this afternoon. This helps a great deal and answers Items 1, 4, and 6 of my 9/30/03 letter.
regards,
Sal

IP7_030707

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/7/2003 12:30:11 PM
Subject: Re: IPSC questions

Jerry,

The cost difference is an additional \$92,750 to supply the DPS for a variable temperature compensated signal output. The additional supply for this temperature compensation includes two temperature elements (temperature transmitters) for each burner windbox, and a DPS-Differential Pressure System transmitter on each burner (versus the DPU dP transmitter originally proposed).

Also, the total price to provide a separate register inner air zone flow measurement on the burners would be an additional \$99,050. The scope on each burner would include (2) VAP pitots, root valves, stainless steel tubing, fittings, continuous purge, a magnahelic gauge for local indication, and installation.

Are we released to go with Eastern Instruments for the burner flow measurement? We don't need an answer right away on the above additional scope, however we do need to now get started on the CFD modeling portion.
regards,
Sal

----- Original Message -----

From: "Jerry Finlinson" <Jerry-F@ipsc.com>
To: <sal@advancedburner.com>
Sent: Wednesday, October 01, 2003 2:22 PM
Subject: Re: IPSC questions

> Thanks Sal,
> We wanted to know what the cost difference is between the DPU and
> the DPS, then we can decide if the extra expense is worth the improved
> accuracy.
> Thanks, Jerry
>
> Jerry Finlinson, Engineer
> Intermountain Power Service Corp
> 850 West Brush Wellman Rd
> Delta, UT 84624
> 435-864-6466 fax 0776/6670
> jerry-f@ipsc.com
>
> >>> "Sal Ferrara" <sal@advancedburner.com> 10/1/2003 11:44:17 AM >>>
>
> IPSC questions Jerry/Tim,
> IPSC should investigate the amount of SA temperature fluctuation
> occurring over the boiler's control range. Knowing this, the maximum
> inaccuracy introduced into the flow measurement, utilizing the DPU, can
> be determined by EI. With the DPU transmitter, a fixed temperature would
> be programmed into the transmitter for the compensation. The temperature
> used for this would be from the middle of the range to minimize this
> inaccuracy, i.e. if temperature fluctuates between 600-700 deg then 650

> deg. would be used for the compensation giving maximum error being
> introduced by the 50 deg delta. I used EI's price for the DPU
> transmitter in our offer , instead of the DPS price with integral
> temperature element on every pitot, since I do not expect that the SA
> temperature fluctuations will be significant enough to matter in the
> measurement.
> regards,
>
> Sal Ferrara
>
>
> ----- Original Message -----
> From: Tim Bodemann
> To: Jerry Finlinson
> Cc: Jim Knapp ; joel@advancedburner.com ; sal@advancedburner.com ;
> JIM-N@ipsc.com ; Phil-H@ipsc.com ; AARON-N@ipsc.com ; BILL-M@ipsc.com
> ; Garry-C@ipsc.com
> Sent: Wednesday, October 01, 2003 12:35 AM
> Subject: RE: IPSC questions
>
>
> Jerry,

> 4) Yes, we can provide what you want within a
> pressure/temperature (density) compensated transmitter (our DPS). We
> have quoted this option to ABT...we will discuss this with ABT so they can
> forward onto you (if not already) the cost associated with this option.

> Again, thank you for your time and we look forward to our
> teleconference and a successful installation.

> Best Regard,

> Tim

CC: "joel vatsky" <joel@advancedburner.com>, "Phil Hailes" <Phil-H@ipsc.com>, "Jim Nelson" <JIM-N@ipsc.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/8/2003 7:15:04 AM
Subject: Re: IPSC questions

Jerry,
I must congratulate Mr. Nelson on the new arrival when he returns.

The price for one probe on inner air zone, without continuous purge, would be \$57,060. Valves would still be provided to facilitate manual purging.
regards,
Sal

----- Original Message -----

From: "Jerry Finlinson" <Jerry-F@ipsc.com>
To: <sal@advancedburner.com>
Cc: <bodemann@easterninstruments.com>; "Phil Hailes" <Phil-H@ipsc.com>
Sent: Tuesday, October 07, 2003 3:07 PM
Subject: Re: IPSC questions

> Ouch, this is starting to go over budget. I need to review with James
> Nelson and Phil before we give the final ok. James is out for a couple
> days. His wife just had a baby. We know you need to get started, so
> we'll try to finalize the decision soon.
>
> We'd like to get the price down on the inner air zone. How much would
> it be if we have only one probe and no continuous purge? We'd still
> need valves for the option of manual purge.
>
> Don't do the release yet.
>
> Thanks, Jerry
>
> Jerry Finlinson, Engineer
> Intermountain Power Service Corp
> 850 West Brush Wellman Rd
> Delta, UT 84624
> 435-864-6466 fax 0776/6670
> jerry-f@ipsc.com
>
> >>> "Sal Ferrara" <sal@advancedburner.com> 10/7/2003 12:38:51 PM >>>
> Jerry,
> The cost difference is an additional \$92,750 to supply the DPS for a
> variable temperature compensated signal output. The additional supply
> for
> this temperature compensation includes two temperature elements
> (temperature
> transmitters) for each burner windbox, and a DPS-Differential Pressure
> System transmitter on each burner (versus the DPU dP transmitter
> originally
> proposed).
>
> Also, the total price to provide a separate register inner air zone
> flow
> measurement on the burners would be an additional \$99,050. The scope on

> each
> burner would include (2) VAP pitots, root valves, stainless steel
> tubing,
> fittings, continuous purge, a magnahelic gauge for local indication,
> and
> installation.
>
> Are we released to go with Eastern Instruments for the burner flow
> measurement? We don't need an answer right away on the above
> additional
> scope, however we do need to now get started on the CFD modeling
> portion.
> regards,
> Sal
>
>
> ----- Original Message -----
> From: "Jerry Finlinson" <Jerry-F@ipsc.com>
> To: <sal@advancedburner.com>
> Sent: Wednesday, October 01, 2003 2:22 PM
> Subject: Re: IPSC questions
>
>
> > Thanks Sal,
> > We wanted to know what the cost difference is between the DPU
> and
> > the DPS, then we can decide if the extra expense is worth the
> improved
> > accuracy.
> > Thanks, Jerry
> >
> > Jerry Finlinson, Engineer
> > Intermountain Power Service Corp
> > 850 West Brush Wellman Rd
> > Delta, UT 84624
> > 435-864-6466 fax 0776/6670
> > jerry-f@ipsc.com
> >
> > > > "Sal Ferrara" <sal@advancedburner.com> 10/1/2003 11:44:17 AM >>>
> >
> > IPSC questions Jerry/Tim,
> > IPSC should investigate the amount of SA temperature fluctuation
> > occurring over the boiler's control range. Knowing this, the maximum
> > inaccuracy introduced into the flow measurement, utilizing the DPU,
> > can
> > be determined by EI. With the DPU transmitter, a fixed temperature
> > would
> > be programmed into the transmitter for the compensation. The
> > temperature
> > used for this would be from the middle of the range to minimize this
> > inaccuracy, i.e. if temperature fluctuates between 600-700 deg then
> > 650
> > deg. would be used for the compensation giving maximum error being
> > introduced by the 50 deg delta. I used EI's price for the DPU
> > transmitter in our offer, instead of the DPS price with integral
> > temperature element on every pitot, since I do not expect that the

IP7 030712

CC: "Phil Hailes" <Phil-H@ipsc.com>

IP7_030713

From: "Chuck Onaitis" <chuck@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 10/8/2003 6:48:35 AM
Subject: Drawing Request

Phil:

In order to complete our General Arrangement we need drawings showing burner front for both the front wall and rear wall. Our main interest is the orientation of the elbows. These drawings would either be burner arrangement drawings- preferable, or coal pipe arrangement drawings.

This is not an immediate need, but we can't complete the GA's without this information.

If you have any questions, give me a call.

Chuck Onaitis

CC: "Sal Ferrara" <sal@advancedburner.com>, "Ron Jones" <ron.jones@adelphia.net>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/9/2003 2:12:54 PM
Subject: Fw: IPSC questions

Jerry,
I just had a conversation with Tim Bodemann and he advised that root valves included for the inner zone price could not be used for manual purging. This means the price I quoted below is incorrect.

The root valves would need to be replaced with 3-way valve assemblies (2 stainless steel valve assemblies per burner). This adds a cost of \$245 per burner register (total of \$11,760 for all 48 burners). In this case the price for one probe on inner air zone, without continuous purge, changes to \$68,020.

Please let me know if you have any questions.

regards,

Sal

----- Original Message -----

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Cc: "Phil Hailes" <Phil-H@ipsc.com>
Sent: Wednesday, October 08, 2003 9:24 AM
Subject: Re: IPSC questions

> Jerry,

> I must congratulate Mr. Nelson on the new arrival when he returns.

>

> The price for one probe on inner air zone, without continuous purge, would
> be \$57,060. Valves would still be provided to facilitate manual purging.

> regards,

> Sal

>

> ----- Original Message -----

> From: "Jerry Finlinson" <Jerry-F@ipsc.com>
> To: <sal@advancedburner.com>
> Cc: <bodemann@easterninstruments.com>; "Phil Hailes" <Phil-H@ipsc.com>
> Sent: Tuesday, October 07, 2003 3:07 PM
> Subject: Re: IPSC questions

>

>

> > Ouch, this is starting to go over budget. I need to review with James
> > Nelson and Phil before we give the final ok. James is out for a couple
> > days. His wife just had a baby. We know you need to get started, so
> > we'll try to finalize the decision soon.

> >

> > We'd like to get the price down on the inner air zone. How much would
> > it be if we have only one probe and no continuous purge? We'd still
> > need valves for the option of manual purge.

> >

> > Don't do the release yet.

> >

> > Thanks, Jerry

> >

> > Jerry Finlinson, Engineer

> > Intermountain Power Service Corp

> > 850 West Brush Wellman Rd
> > Delta, UT 84624
> > 435-864-6466 fax 0776/6670
> > jerry-f@ipsc.com
> >
> > >>> "Sal Ferrara" <sal@advancedburner.com> 10/7/2003 12:38:51 PM >>>
> > Jerry,
> > The cost difference is an additional \$92,750 to supply the DPS for a
> > variable temperature compensated signal output. The additional supply
> > for
> > this temperature compensation includes two temperature elements
> > (temperature
> > transmitters) for each burner windbox, and a DPS-Differential Pressure
> > System transmitter on each burner (versus the DPU dP transmitter
> > originally
> > proposed).
> >
> > Also, the total price to provide a separate register inner air zone
> > flow
> > measurement on the burners would be an additional \$99,050. The scope on
> > each
> > burner would include (2) VAP pitots, root valves, stainless steel
> > tubing,
> > fittings, continuous purge, a magnahelic gauge for local indication,
> > and
> > installation.
> >
> > Are we released to go with Eastern Instruments for the burner flow
> > measurement? We don't need an answer right away on the above
> > additional
> > scope, however we do need to now get started on the CFD modeling
> > portion.
> > regards,
> > Sal
> >
> >
> > ----- Original Message -----
> > From: "Jerry Finlinson" <Jerry-F@ipsc.com>
> > To: <sal@advancedburner.com>
> > Sent: Wednesday, October 01, 2003 2:22 PM
> > Subject: Re: IPSC questions
> >
> >
> > > Thanks Sal,
> > > We wanted to know what the cost difference is between the DPU
> > > and
> > > the DPS, then we can decide if the extra expense is worth the
> > > improved
> > > accuracy.
> > > Thanks, Jerry
> > >
> > > Jerry Finlinson, Engineer
> > > Intermountain Power Service Corp
> > > 850 West Brush Wellman Rd
> > > Delta, UT 84624
> > > 435-864-6466 fax 0776/6670

> > > jerry-f@ipsc.com
> > >
> > >>> "Sal Ferrara" <sal@advancedburner.com> 10/1/2003 11:44:17 AM >>>
> > >
> > > IPSC questions Jerry/Tim,
> > > IPSC should investigate the amount of SA temperature fluctuation
> > > occurring over the boiler's control range. Knowing this, the maximum
> > > inaccuracy introduced into the flow measurement, utilizing the DPU,
> > > can
> > > be determined by EI. With the DPU transmitter, a fixed temperature
> > > would
> > > be programmed into the transmitter for the compensation. The
> > > temperature
> > > used for this would be from the middle of the range to minimize this
> > > inaccuracy, i.e. if temperature fluctuates between 600-700 deg then
> > > 650
> > > deg. would be used for the compensation giving maximum error being
> > > introduced by the 50 deg delta. I used EI's price for the DPU
> > > transmitter in our offer, instead of the DPS price with integral
> > > temperature element on every pitot, since I do not expect that the
> > > SA
> > > temperature fluctuations will be significant enough to matter in the
> > > measurement.
> > > regards,
> > >
> > > Sal Ferrara
> > >
> > >
> > > ----- Original Message -----
> > > From: Tim Bodemann
> > > To: Jerry Finlinson
> > > Cc: Jim Knapp ; joel@advancedburner.com ; sal@advancedburner.com ;
> > > JIM-N@ipsc.com ; Phil-H@ipsc.com ; AARON-N@ipsc.com ; BILL-M@ipsc.com
> > >
> > > ; Garry-C@ipsc.com
> > > Sent: Wednesday, October 01, 2003 12:35 AM
> > > Subject: RE: IPSC questions
> > >
> > >
> > > Jerry,
> > >
> > >
> > >
> > >
> > > 4) Yes, we can provide what you want within a
> > > pressure/temperature (density) compensated transmitter (our DPS).
> > > We
> > > have quoted this option to ABT...we will discuss this with ABT so they
> > > can
> > > forward onto you (if not already) the cost associated with this
> > > option.
> > >
> > >
> > > Again, thank you for your time and we look forward to our
> > > teleconference and a successful installation.
> > >

>>>
>>
>>>
>>>
>>>
>>> Best Regard,
>>>
>>>
>>>
>>> Tim
>>>
>>>
>>>
>>>
>>
>>
>>
>

CC: "Jim Nelson" <JIM-N@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 10/13/2003 7:48:30 AM
Subject: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Phil,

We looked into the cost associated with substituting the 309 S.S. portions of our burner registers with 253 MA material. The 253 MA is more expensive than 309 S.S. and the total additional cost per burner assembly would be \$ 850 (a total of \$ 40,800 for all 48 burners).

Please let me know if whether or not you are interested in implementing this material change. We are starting to purchase the materials for fabrication so I would like a decision by this Friday, 10/17/03, or let me know if you have any questions.

regards,
Sal

CC: "Jim Nelson" <JIM-N@ipsc.com>



SUITE 5, 350 MAIN STREET
BEDMINSTER, NJ 07921
Phone: 908-470-0470; FAX: 908-470-0479

TELECOPY COMMUNICATION

DATE: September 4, 2003

FAX NO:

ATTENTION OF: Phil Hailes

COMPANY'S NAME: IPSC

NUMBER OF PAGES (INCLUDING COVER SHEET): 4

FROM: Joel Vatsky

VERIFICATION NUMBER: (908) 470-0721

ABT CORPORATION'S TELECOPY NUMBER:

(908) 470-0479 – Xerox Automatic (Set to receive 24 hours a day)

REMARKS:

Phil:

The conversation I had earlier with James made us put on our engineering thinking caps again regarding the elbows. We have figured out a way to install our X-vane distribution assembly without requiring the elbows to leave the site.

Attached is a hand sketch showing a 6" wide flanged pool piece, lined, to which the X-vanes are attached. This is first bolted to the elbow and becomes one ass'y, which is then bolted to the fuel tube (made 6" shorter). Taking into account the shipping and shop savings we would accrue, there is an additional cost of \$850.00 per burner. However, it has the advantage of giving the performance we want while keeping the elbow and X-vanes separate (similar to what we do with the flatback elbow, except in this case we do the attachment from the outlet end rather than the back). The kicker can be field installed. We are checking with our fabricator to see if they can send two of their people out to do this, rather than rely on the field labor.

If you prefer to have the elbows completely relined, our shop can do it within the same two week period allotted. The additional cost is \$1000.00 per burner.

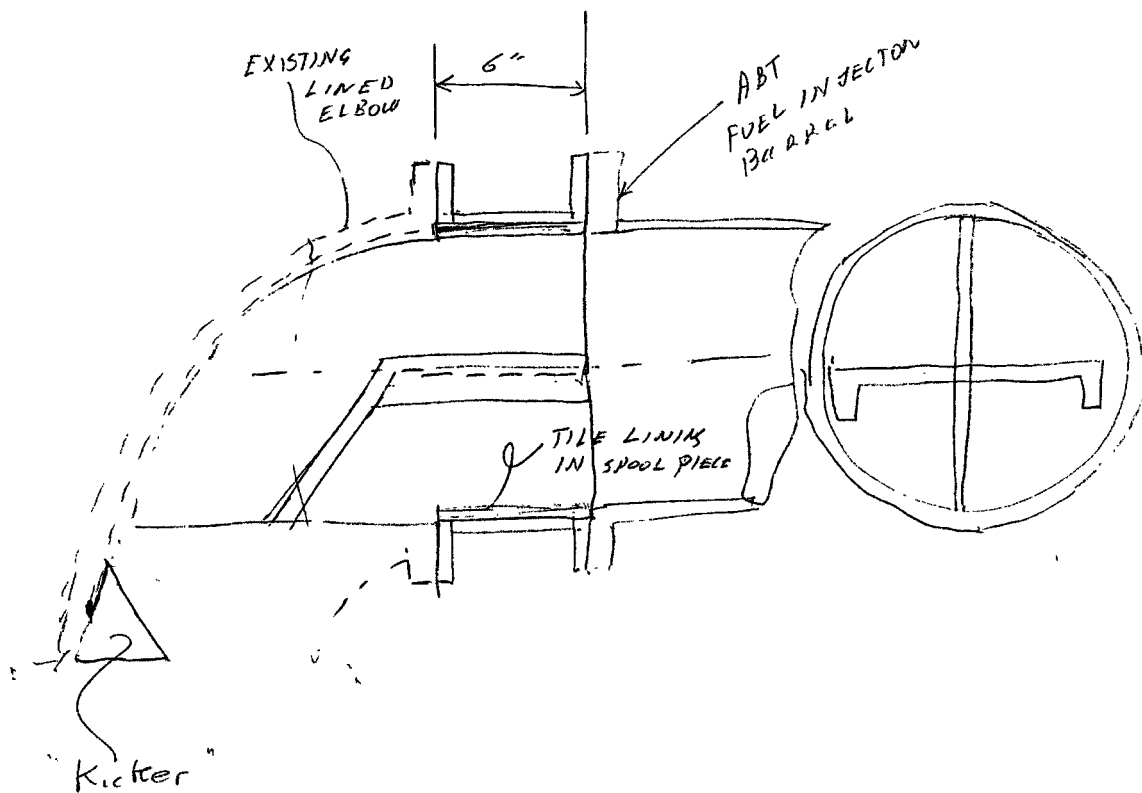
We can go either way. If the elbows have additional life it may not be necessary to reline them now. But this is your call.

I hope this sets this issue to bed.

Please call or e-mail to let us know you have received this FAX.

Regards,
Joel

IP7_030720



X-VANE SPOOL PIECE.

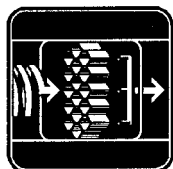
IPP

QEO 09/04/03

ABT

From: Matt Maragos <mmaragos@airmonitor.com>
To: Phil Hailes <Phil-H@ipsc.com>, Sal Ferrara <sal@advancedburner.com>
Date: 10/24/2003 9:10:16 AM
Subject: Revised Proposal for Intermountain Power IBAMs

CC: Ken Hall <khpquip@earthlink.net>, Nick Ferri <Nwferri@msn.com>, "Dave Earley (CT)" <dearley@nc.rr.com>, Mike Stapf <mstapf@ix.netcom.com>, James Nelson <James-N@ipsc.com>, Jerry Finlinson <Jerry-F@ipsc.com>



AIR MONITOR CORPORATION

Email/FAX TRANSMISSION

Date: October 24, 2003

No. of Pages: 4
(includes this page)

TO:	Sal Ferrara Advanced Burner Technologies Phil Hailes Intermountain Power	FROM:	Matt Maragos Sales Development Manager
CC:	Jerry Finlinson – Intermountain Power James Nelson – Intermountain Power Ken Hall – PowerQuip Mike Stapf – Stapf Dave Earley – Air Monitor Corp. Nick Ferri – Air Monitor Corp.		Air Monitor Corporation 178 Mine Lake Court Raleigh, NC 27615
Fax:	Email	Fax:	919-844-3105
Phone:		Phone:	919-844-3100

REMARKS: ☒ URGENT ☒ FOR YOUR REVIEW ☐ PLEASE COMMENT

RE: Improving Plant Performance and Efficiency with Air Monitor's Accurate Individual Burner Airflow Measurement (IBAM) Systems
Air Monitor Proposal Number: 102403-1.1

Gentlemen,

Please find this revised proposal for Air Monitor's burner airflow measurement systems for use at Intermountain Power.

Per request of Intermountain Power, the following items are included in this proposal:

Installation:

- 1) Air Monitor will work with Advanced Burner Tech to provide installation drawings and material for the tubing lines from the burner through the wind box wall: i.e., tubing temperature expansion bends, hangers/supports and flex connections to allow wind box expansion.
- 2) The installation will be 48 VELTRON II transmitters with AUTO-purge III/sp, with no pressure or temperature density correction, but will have a 4-20 mA output to the DCS and AUTO-purge included.
- 3) Stainless steel tubing is provided to tie (header) the IBAMs together and then forward the dP signal from the IBAM Pitot header to the bulkhead. The transmitter cabinets, one on each burner level, and will be installed with factory installed VELTRON II differential pressure transmitters and AUTO-purge

IP7_030723

valves. Transmitters will be installed in NEMA 4 cabinets on each burner level. Minimum of 8 cabinets, it would be ok to use 16 cabinets to allow shorter tubing runs. Tubing will be supplied from the transmitter cabinet to the Pitots with necessary fittings, expansion joints and flex connections.

- 4) Delivery of transmitter/purge panels shall be onsite by 18 Feb 2004. Delivery of probes to preinstall on burners shall be coordinated with ABT prior to shipment of the burners.
- 5) Includes 4 on-site man-days for Air Monitor factory technician startup and training support.

Accuracy:

Accuracy of better than 3% will be assured by:

- 1) Installing 3 IBAM stainless steel Pitot probes (144 total) in each burner on the burner back plate or at optimal locations determined by experimental wind tunnel testing and/or CFD. During the testing configurations of 2, 3 and 4 probes will be compared for accuracy.
- 2) Air Monitor performing or subcontracting to Air Flow Sciences or other vendor CFD modeling of the burner flow to determine the predicted best probe location and to assist ABT in designing the optimum holes in the perforated plate. This work not to exceed \$10,000 (included in the system pricing below). Coordinate with ABT on selecting preferred CFD vendor.
- 3) Setting up full scale wind tunnel testing with a full scale mockup (the actual burner may be used if available) to verify that there is agreement better than 3% between the air flow in a certified flow nozzle and the Pitots in the burner. This will be done at flow velocities similar to those in the burner installation. A chamber simulating IPSC's wind box will be constructed of at least 10 ft x 10 ft x 10 ft with air flowing in from varying directions to simulate real world conditions. Verify 3% accuracy maintained over 3:1 velocity turndown. A test matrix of sleeve damper position, swirler angle, # of probes, probe location will be run for various flow rates. Customer observations of the air flow testing will be encouraged and supported.
- 4) Wind tunnel testing shall commence prior to Feb 2004.

Pluggage:

- 1) Supplied AUTO-purge system will be programmed for a 1 minute high pressure AUTO-purge once per day to remove fly ash particles from the IBAM probes. Within each enclosure the purges will be sequential.
- 2) Low turbulence and vortexes are expected due to the perforated plate, which will be designed according to CFD models to minimize turbulence and vortexes inside the burners.

Equipment Failure:

- 1) Should the IBAM Pitots or AUTO-purge system become damaged due to elevated temperatures, vibration, pluggage or other unforeseen failure mode, Air Monitor will provide a 2 year replacement warranty of all equipment; as long as the burner structure at the IBAM Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) Air Monitor will fabricate replacement Pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit. The new replacement probes will be provided within a timely period within 3 months maximum to meet IPSC's outage windows.
- 3) The replacement IBAM Pitots will carry a renewed 2 year guarantee from the time of installation.

Upon successful installation and performance, IPSC agrees that Air Monitor can use IPSC as a reference and publish the results in a white paper.

Please note that wind tunnel testing is included in the pricing below. Also, we would recommend mounting the transmitters and AUTO-purge systems off the front plate of the burners. The transmitters and AUTO-purge system will be grouped into single enclosures per burner deck.

Air Monitor's systems provide accurate combustion airflow measurement to each burner. Air Monitor systems provide the means to accurately balance and/or bias burner stoichiometries to lower NO_x levels, reduce LOI, and increase overall boiler performance.

Benefits of Air Monitor's Accurate Burner-to-Burner Secondary Airflow (SA) Measurement:

- Accurate SA measurement to each burner will allow for airflow balancing or biasing on a burner by burner basis.
- Air Monitor equipment provides accurate measurement through 10:1 turndown, resulting in improved emissions at all operating loads.
- Air Monitor's Individual Burner Airflow Measurement will provide for improved burner stoichiometry and improved plant performance through decreased NO_x, improved LOI, etc.
- Air Monitor's Patented IBAM™ Probe will be provide an accurate measurement suitable for future use in conjunction with a neural network or other online combustion optimization systems.

Air Monitor's IBAM probes have been successfully implemented in thousands of burners through North America. For the burners at Intermountain, we will need to perform wind tunnel testing to determine the proper set up and orientation characteristics.

The burner wind tunnel test has a matrix of sleeve damper position, swirler angle and load (which will establish total SA to burner). As the operational ranges of the sleeve damper position, swirler angle and load vary from facility to facility, we are providing a quotation for a typical burner test. A typical burner wind tunnel test has a matrix of sleeve damper position, swirler angle and load that will cover a minimum of 48 test points of varying damper position, swirler angle and load.

Based on our testing experience, this matrix (range) will be sufficient for most operational configurations. If it is found that the operational range extends outside of our standard matrix, this can be expanded. Expansion of the wind tunnel testing may result in additional cost. The wind tunnel testing is included with the IBAM probes.

The following equipment will be required for the burner airflow measurement:

Burner drawings are required.

Individual Burner Airflow Measurement Systems

IBAM Burner Probes (3 per Burner)

The IBAM burner probe, derived from the patented VOLU-probe technology, utilizes the Pitot-Fechheimer principle together with its patented chamfered total pressure port and is ideal for both new burner installations and existing burner retrofits. Constructed entirely of 316 Stainless Steel, the IBAM burner probe is suited for clean or harsh and particulate laden applications, operating at temperatures ranging from -20 to 900°F.

VELTRON II Computer w/AUTO-purge III/sp (1 per burner)

The VELTRON II is an Ultra-Low Differential Pressure and "smart" flow computer. All VELTRON II's are equipped with a 2x16 liquid crystal display (LCD) for use during configuration and calibration. During normal operation, one output is displayed (differential pressure), scaleable in user selectable format and units of measure. The VELTRON II is furnished with an automatic zeroing circuit capable of electronically adjusting the zero at predetermined time intervals while simultaneously maintaining the output signal. The VELTRON II with its high level of accuracy and automatic zeroing circuitry, can maintain linear output signals on applications requiring velocity turndown of 10 to 1 (equal to a velocity pressure turndown of 100 to 1). The VELTRON II is also equipped with AUTO-purge management that initiates and times the purging cycle. The AUTO-purge III is a high pressure purge circuit that applies high pressure, high volume air back through the total pressure and static pressure sensing lines to clean sensing manifolds and sensors, preventing build-up of flyash, dirt and other particles which may be present in the air stream. The AUTO-

purge III incorporates brass and copper construction for all wetted tubing, fittings and valves. Standard input power to the VELTRON II with AUTO-purge III is 24V(AC or DC) with optional 120VAC input available. The system is supplied as standard installed in a painted steel NEMA 4 enclosure.

The VELTRON II w/AUTO-purge III/sp systems will be grouped into NEMA 4 enclosures to complement the placement of the burners (e.g., six per enclosure).

Price for Forty-Eight (48) IBAM Systems\$200,000.
Wind tunnel testing and burner mock up is required and included in the above price.

Factory technician start up assistance is included in the above prices for this project. An Air Monitor Factory technician will be on site to ensure that the equipment is properly connected and calibrated (spanned). The factory technician will train on site personnel in the operation of Air Monitor products.

All prices in United States Dollars.

Shipping Schedule: 6-10 weeks after approval of submittal drawings or order release. Submittal drawings will be completed within 3 weeks after receipt of order.

Terms: Net 30 Days.
F.O.B: Santa Rosa, CA.

This proposal is valid for sixty days.

We look forward to working with you on all of your airflow measurement projects. We hope that you will allow us the opportunity to supply systems that will provide the accuracy and repeatability that is necessary to improve your plant performance and reduce NO_x emissions.

We thank you for your interest in Air Monitor's systems. If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

Matt Maragos
Air Monitor Corporation

Copyright © 2003

This information is the CONFIDENTIAL and PROPRIETARY information of Air Monitor Corporation. Its use, reproduction, or copying by any means without written consent of Air Monitor Corporation is hereby prohibited.

From: Jerry Finlinson
To: James Nelson; Phil Hailes
Date: 10/23/2003 4:45:04 PM
Subject: IPP selects Air Monitor for ABT burner flow measurements

Phil,

We have worked out the terms with Air Monitor for a total ABT burner total air flow measurement on our U2 Low NOx burner upgrade. This includes CFD calcs, wind tunnel testing to guarantee 3% accuracy, 3 probes per burner, and automatic purge air panels. Air Monitor will be forwarding an updated proposal to us and ABT. We plan to get IPP and Air Monitor to sign this terms agreement.

If you need to make changes to the terms document it is located in:

N:\Current\Projects\IGS03\IGS03 - F Unit 2 Modified Burners\BURNER FLOW XMTR\Air Monitor contract V2.wpd

We can let Sal of ABT and Tim of Eastern Instruments know of the decision. Based on Air Monitor's experience and references, I have full confidence that this is going to be an excellent system. Let me know if you have further questions.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

CC: Bill Morgan; Dave Earley - Combustion Technologies; Matt Maragos; Sal Ferrara

IP7_030727

Addendum to IPSC Contract 04-45606, Unit 2 Low NOx Burners

23 Oct 2003

Based on cost and experience we recommend Air Monitor as the vendor for burner air flow measurement in the U2 Low NOx burners.

We propose the following terms as the base for purchasing and installing Air Monitor's IBAM probes on 48 Low Nox burners on U2 in March 2004. This addresses our concerns with installation, accuracy, plugging, and equipment failure:

Installation:

- 1) Air Monitor will work with Advanced Burner Tech to provide installation drawings and material for the tubing lines from the burner through the wind box wall: ie, tubing temperature expansion bends, hangers/supports and flex connections to allow wind box expansion.
- 2) The installation will be 48 Velotron II transmitters with Auto-purge II/sp, with no pressure or temperature density correction, but will have a 4-20 mA output to the DCS and autopurge included.
- 3) Stainless steel tubing is provided to tie (header) the IBAM's together and then forward the dP signal from the IBAM pitot header to the bulkhead. The transmitter cabinets, one on each burner level, and will be installed with factory installed Velotron II differential pressure transmitters and auto purge valves. Transmitters will be installed in NEMA 4 cabinets on each burner level. Minimum of 8 cabinets, it would be ok to use 16 cabinets to allow shorter tubing runs. Tubing will be supplied from the transmitter cabinet to the pitots with necessary fittings, expansion joints and flex connections.
- 4) Delivery of transmitter/purge panels shall be onsite by 18 Feb 2004. Delivery of probes to preinstall on burners shall be coordinated with ABT prior to shipment of the burners.
- 5) Includes 4 on-site man-days for Air Monitor factory technician startup and training support.

Accuracy:

Accuracy of better than 3% will be assured by:

- 1) Installing 3 IBAM stainless steel pitot probes (144 total) in each burner on the burner backplate or at optimal locations determined by CFD and experimental wind tunnel testing. During the testing configurations of 2, 3 and 4 probes will be compared for accuracy.
- 2) Air Monitor performing or subcontracting to Air Flow Sciences or Advanced Combustion CFD modeling of the burner flow to determine the predicted best probe location and to assist ABT in designing the optimum holes in the perforated plate. This work not to exceed \$10K. Coordinate with ABT on selecting preferred CFD vendor.
- 3) Setting up full scale wind tunnel testing with a full scale mockup (the actual burner may be used if available) to verify that there is agreement better than 3% between the air flow in a certified flow nozzle and the pitots in the burner. This will be done at flow velocities similar to those in the burner installation. A chamber simulating IPSC's wind box will be constructed of at least 10 ft x 10 ft x 10 ft with air flowing in from varying directions to simulate real world conditions. Verify 3% accuracy maintained over 3:1 velocity turndown. A test matrix of sleeve damper position, swirler angle, # of probes, probe location will be run for various flowrates.

Customer observations of the air flow testing will be encouraged and supported.

4) Wind tunnel testing shall commence prior to Feb 2004.

Pluggage:

1) Supplied autopurge system will be programmed for a 1 minute high pressure autopurge once per day to remove fly ash particles from the IBAM probes. Within each enclosure the purges will be sequential.

2) Low turbulence and vortexes are expected due to the perforated plate, which will be designed according to CFD models to minimize turbulence and vortexes inside the burners.

Equipment Failure:

1) Should the IBAM pitots or auto purge system become damaged due to elevated temperatures, vibration, pluggage or other unforeseen failure mode, Air Monitor will provide a 2 year replacement warranty of all equipment; as long as the burner structure at the IBAM Pitot insertion location has not been damaged also as a result of elevated temperatures.

2) Air Monitor will fabricate replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit. The new replacement probes will be provided within a timely period within 3 months maximum to meet IPSC's outage windows.

3) The replacement IBAM pitots will carry a renewed 2 year guarantee from the time of installation.

Upon successful installation and performance, IPSC agrees that Air Monitor can use IPSC as a reference and publish the results in a white paper.

From: Jerry Finlinson
To: Matt Maragos; Phil Hailes
Date: 10/23/2003 12:03:03 PM
Subject: Re: Air Monitor's Revised Proposal

Matt,

We appreciate your experience and pricing. We need to make a decision quickly, so that we can move forward with this project, as the selected flow vendor is expected to do CFD modeling of the internal burner flows and assist ABT in designing the perforated plate. I have assembled our understanding of your proposal terms, could you please review this document, update your proposal to include all the items on this document and forward a copy of the updated proposal to ABT and to us? We plan to include this document, with some clarifications/modifications in our contract document with ABT.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> Matt Maragos <mmaragos@airmonitor.com> 10/21/2003 1:51:17 PM >>>
Gentlemen,

Please find these revisions to Air Monitor's proposal:

1. The price has been reduced by the amount of the purge systems (\$1500 per burner). The AUTO-purge systems are included with the price below.
2. One additional probe per burner has been included at no cost. For a total of three probes per burner.
3. One set of interconnect tubing per burner has been included at no additional cost.

Price for Forty-Eight (48) IBAM Systems = \$191,040.

Intermountain has been a great customer of Air Monitor, we appreciate your past business and look forward to a long term partnership providing the best airflow measurement systems available.

If you have any questions or concerns, please do not hesitate to contact us.

Thank you.

Sincerely,

Matt Maragos
Air Monitor Corporation

CC: Dave Earley (CT); James Nelson; Ken Hall

DRAFT

23 Oct 2003

Addendum to IPSC Contract 04-45606, Unit 2 Low NOx Burners

We propose the following terms as the base for purchasing and installing Air Monitor's IBAM probes on 48 Low Nox burners on U2 in March 2004. This addresses our concerns with installation, accuracy, plugging, and equipment failure:

Installation:

- 1) Air Monitor will work with Advanced Burner Tech to provide installation drawings and material for the tubing lines from the burner through the wind box wall: ie, tubing temperature expansion bends, hangers/supports and flex connections to allow wind box expansion.
- 2) The installation will be 48 Velotron II transmitters with Auto-purge II/sp, with no pressure or temperature density correction, but will have a 4-20 mA output to the DCS and autopurge included.
- 3) Stainless steel tubing is provided to tie (header) the IBAM's together and then forward the dP signal from the IBAM pitot header to the bulkhead. The transmitter cabinets, one on each burner level, and will be installed with factory installed Velotron II differential pressure transmitters and auto purge valves. Transmitters will be installed in NEMA 4 cabinets on each burner level. Minimum of 8 cabinets, it would be ok to use 16 cabinets to allow shorter tubing runs. Tubing will be supplied from the transmitter cabinet to the pitots with necessary fittings, expansion joints and flex connections.
- 4) Includes 4 on-site man-days for Air Monitor factory technician startup and training support.

Accuracy:

Accuracy of better than 2% will be assured by:

- 1) Installing 3 IBAM stainless steel pitot probes (144 total) in each burner on the burner backplate or at optimal locations determined by CFD and experimental wind tunnel testing. During the testing configurations of 2, 3 and 4 probes will be compared for accuracy.
- 2) Air Monitor performing or subcontracting to Air Flow Sciences CFD modeling of the burner flow to determine the predicted best probe location and to assist ABT in designing the optimum holes in the perforated plate.
- 3) Setting up full scale wind tunnel testing with a full scale mockup (the actual burner may be used if available) to verify that there is agreement better than 2% between the air flow in a certified flow nozzle and the pitots in the burner. This will be done at flow velocities similar to those in the burner installation. A chamber simulating IPSC's wind box will be constructed of at least 10 ft x 10 ft x 10 ft with air flowing in from varying directions to simulate real world conditions. Verify 2% accuracy maintained over 10:1 velocity turndown. A test matrix of sleeve damper position, swirler angle, # of probes, probe location will be run for various flowrates. Customer observations of the air flow testing will be encouraged and supported.

Pluggage:

- 1) Supplied autopurge system will be programmed for a 1 minute high pressure autopurge once per day to remove fly ash particles from the IBAM probes, within each enclosure, the purges will be sequential.

IP7_030731

2) Low turbulence and vortexes are expected due to the perforated plate, which will be designed according to CFD models to minimize turbulence and vortexes inside the burners.

Equipment Failure:

- 1) Should the IBAM pitots or auto purge system become damaged due to elevated temperatures, vibration, pluggage or other unforeseen failure mode, Air Monitor will provide a 2 year replacement warranty of all equipment; as long as the burner structure at the IBAM Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) Air Monitor will fabricate replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit. The new replacement probes will be provided within a timely period within 3 months maximum to meet IPSC's outage windows.
- 3) The replacement IBAM pitots will carry a renewed 2 year guarantee from the time of installation.

Upon successful installation and performance, IPSC agrees that Air Monitor can use IPSC as a reference and publish the results in a white paper.

From: James Nelson
To: Jerry Finlinson; Phil Hailes
Date: 10/23/2003 7:51:25 AM
Subject: Fwd: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Lets get together and finalize this, this morning. thx

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/22/2003 3:19:14 PM >>>
Jerry,

We accept the addendum attached, as is.

Per my discussion with James Nelson, we only ask (and he was ok with this) that should automatic purging systems be required down the road (Item #3 under "Pluggage"), that Eastern Instruments gets first right of refusal to manufacture them for IPSC. Also, I believe that James did not have a problem with stating that IPSC would co-authoring along with Eastern Instruments, a published white paper, highlighting the results.

Again, we look forward to working with you and ABT on this project. If you have any further questions, please give me a call (919-345-6730).

Best Regards,

Tim

-----Original Message-----

From: Jerry Finlinson [<mailto:Jerry-F@ipsc.com>]
Sent: Thursday, October 16, 2003 6:23 PM
To: Tim Bodemann
Cc: James Nelson; Phil Hailes
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Tim,

Thanks for working with us on this contract and being willing to stand behind your product, your remedies are reasonable. We are working up an addendum to the contract that we'd like both your and our company presidents to sign outlining your commitment to this project. As you understand, since this is a first for ABT to have flow measurements in their burners and it is a first for your pitots to be installed in pulverized coal burners, there is a high level of uncertainty and risk for us. Eastern Instruments stands to benefit greatly if this project turns out as well as we all hope.

I have assembled all the emails containing items that we have agreed to pertaining to installation, accuracy, pluggage and probe failure. Please review and suggest modifications as required, James Nelson will also review it for us, but he is out Thurs and Friday, so won't be back on it until next week.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd

IP7_030733

Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/15/2003 4:04:02 PM >>>
James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

- 1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of the VAP/PA pitots as stated in Item #1 above.
- 3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.
- 4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to Jerry.
- 5) We believe the ceramic material to be superior to the stainless steel as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann
Sent: Tuesday, October 14, 2003 5:38 PM
To: 'Jerry Finlinson'

IP7_030734

Cc: Bill Morgan; James Nelson; Phil Hailes; sal@advancedburner.com; joel@advancedburner.com
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT

burner due to the effects of elevated operational temperatures.
Should
replacements be required, Eastern Instruments will replace the VAP/PA
pitots as needed."

We trust this will address and eliminate your concerns as stated below
and we look forward to initiating engineering and construction on the
project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [<mailto:Jerry-F@ipsc.com>]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a
coal
burner flow.

We intend to connect the transmitter signal to our DCS and use that to
balance the windbox air flow dampers with online control. So we'd
like
the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to
1121F and the coal pipe temps range from 615 to 785F. We often see
backplate temperatures of 1200F. Obviously your probes could not
survive that environment. Then when we have the occasional burner
fire,
the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate
where the probes are located will be behind some turning vanes. Do
you
have measurements of the temperature in the location where we are
proposing to put the probes? Is there an installed base using this
type
of burner, where they have measured the temps online? Have you done
enough detailed CFD modeling that you can accurately predict the
temperature?

We would hate to have all these nice aluminum probes droop down in
service and have to go in and replace them all at the next outage.
What

is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large of a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F, can ABT guarantee that they will not exceed that temperature in this burner design?

If the probes melt and sag are you willing to replace them with some stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,

Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.
regards,
Sal

16 Oct 2003

Addendum to IPSC Contract 04-45606, Unit 2 Low NOx Burners

VAP3/PA = Velocity Averaging Parallel Plate Pitot for Heavy Particulate Applications

We accept ABT's baseline price and recommendation of Eastern Instruments for individual burner flow measurements subject to the following conditions which address our concerns with installation, accuracy, plugging, and probe failure:

Installation:

- 1) Eastern Instruments will work with Advanced Burner Tech to provide installation drawings and material for the tubing lines from the burner through the wind box wall: ie, tubing temperature expansion bends, hangers/supports and flex connections to allow wind box expansion.
- 2) The installation will be of the DPU transmitter, with no pressure or temperature density correction, but will have a 4-20 mA output to the DCS.
- 3) Stainless steel tubing is provided within our proposal to tie (header) the VAP's together and then forward the dP signal from the VAP pitot header to the bulkhead. The transmitter cabinets, one on each burner level, and will be installed with factory installed DPU differential pressure transmitters and manual isolation valve for manual purging. Tubing will be supplied from the transmitter cabinet to the pitots with necessary fittings, expansion joints and flex connections.
- 4) Includes four man-days for EI startup and hands on training time for plant personnel on the EI transmitter setup and calibration.

Accuracy:

Accuracy of better than 1.5% will be assured by:

- 1) Installing 4 pitot probes in each burner at 4 equal quadrants,
- 2) Doing initial CFD modeling to determine the predicted best probe location and designing the optimum holes in the perforated plate, and
- 3) Setting up full scale wind tunnel testing with the actual burner to verify that there is agreement better than 1.5% between the air flow in an AMCA/ANSI certified flow nozzle and the pitots in the burner. This will be done at flow velocities similar to those in the burner installation. A chamber simulating IPSC's wind box will be constructed of at least 10 ft x 10 ft x 10 ft with air flowing in from the side. Customer observations of the air flow testing will be encouraged and supported.

Pluggage:

- 1) Supplied continuous purge option provides positive pressure within the dP sensing chambers. The flow rate of continuous purge is so low that it does not affect biasing. Even if the balance in the purge was skewed 100%, it would only affect the dP by less than 1 to 2% (1 to 2% error in a worst case scenario).
- 2) Low turbulence and vortexes are expected due to the perforated plate, which will be designed according to CFD models to minimize turbulence and vortexes inside the burners.
- 3) Agree to IPSC withholding \$35K until the next extended outage opportunity (probably 1 to 2

years later) upon which time several probes will be removed and examined for pluggage. If significant pluggage has occurred those funds will be forfeited and applied to the cost of an Air Monitor purging system.

4) All the tubing will be installed with manual isolation valves and quick connections to allow for manual purging, should that be required on a routine basis and to allow for tubing leak testing on initial installation.

5) The VAP technology was designed to handle turbulent airflow streams better than other pitot technologies. Please note (contrary to popular belief) that cylindrical pitots as shown in Brandt's technical paper, do not handle turbulent (pitch and yaw) flows well at all (and this is also referenced by other technical authors as noted within the paper).

Probe Failure:

1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures or vibration or other unforeseen failure mode, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.

2) If we together (IPP & EI) determine the failure to not be an isolated anomaly (occurring in only 2 or 3 burners over an entire year), but rather to be inherent within several or many burners, Eastern Instruments will replace all 192 of the VAP/PA pitots as stated in Item #1 above. Eastern will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit. The new replacement probes will be provided within a timely period within 3 months minimum to meet IPSC's outage windows.

3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation (what is this known deviation?).

4) The replacement VAP/PA Pitots will carry a renewed 2 year guarantee from the time of installation.

5) Eastern believes the ceramic material to be superior to stainless steel, but stands strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum). Eastern would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Upon successful installation and performance, IPSC agrees that Eastern Instruments can use IPSC as a reference and publish the results in a white paper.

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/22/2003 3:24:16 PM
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We accept the addendum attached, as is.

Per my discussion with James Nelson, we only ask (and he was ok with this) that should automatic purging systems be required down the road (Item #3 under "Pluggage"), that Eastern Instruments gets first right of refusal to manufacture them for IPSC. Also, I believe that James did not have a problem with stating that IPSC would co-authoring along with Eastern Instruments, a published white paper, highlighting the results.

Again, we look forward to working with you and ABT on this project. If you have any further questions, please give me a call (919-345-6730).

Best Regards,

Tim

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com]
Sent: Thursday, October 16, 2003 6:23 PM
To: Tim Bodemann
Cc: James Nelson; Phil Hailes
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Tim,

Thanks for working with us on this contract and being willing to stand behind your product, your remedies are reasonable. We are working up an addendum to the contract that we'd like both your and our company presidents to sign outlining your commitment to this project. As you understand, since this is a first for ABT to have flow measurements in their burners and it is a first for your pitots to be installed in pulverized coal burners, there is a high level of uncertainty and risk for us. Eastern Instruments stands to benefit greatly if this project turns out as well as we all hope.

I have assembled all the emails containing items that we have agreed to pertaining to installation, accuracy, pluggage and probe failure. Please review and suggest modifications as required, James Nelson will also review it for us, but he is out Thurs and Friday, so won't be back on it until next week.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

IP7_030740

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/15/2003 4:04:02

PM >>>

James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner

structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.

2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of

the VAP/PA pitots as stated in Item #1 above.

3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.

4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to Jerry.

5) We believe the ceramic material to be superior to the stainless steel

as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for

the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann

Sent: Tuesday, October 14, 2003 5:38 PM

To: 'Jerry Finlinson'

Cc: Bill Morgan; James Nelson; Phil Hailes; sal@advancedburner.com;
'joel@advancedburner.com'

Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

IP7_030741

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA

pitots as needed."

We trust this will address and eliminate your concerns as stated below and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a coal burner flow.

We intend to connect the transmitter signal to our DCS and use that to balance the windbox air flow dampers with online control. So we'd like the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to 1121F and the coal pipe temps range from 615 to 785F. We often see backplate temperatures of 1200F. Obviously your probes could not survive that environment. Then when we have the occasional burner fire, the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate where the probes are located will be behind some turning vanes. Do you have measurements of the temperature in the location where we are proposing to put the probes? Is there an installed base using this type of burner, where they have measured the temps online? Have you done enough detailed CFD modeling that you can accurately predict the temperature?

We would hate to have all these nice aluminum probes droop down in service and have to go in and replace them all at the next outage. What is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large

of
a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F,
can ABT guarantee that they will not exceed that temperature in this
burner design?

If the probes melt and sag are you willing to replace them with some
stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,
Following up on your telephone discussion last Friday with Tim
Bodemann, Eastern Instruments is offering a high temperature guarantee
on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after
shipment) against workmanship and/or material defect. In addition, we
will guarantee for 1 year (up to 18 months after shipment) that the
VAP/PA pitots can withstand operating temperatures up to 1000 degrees
F
in the ABT burner as designed. Should the VAP/PA pitots structurally
fail at temperatures below the 1000 degree F range, Eastern
Instruments
will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as
IPSC makes a decision on the approved Airflow Measuring System
supplier.
regards,
Sal

CC: "James Nelson" <JIM-N@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>,
<sal@advancedburner.com>

IP7_030744

16 Oct 2003

Addendum to IPSC Contract 04-45606, Unit 2 Low NOx Burners

VAP3/PA = Velocity Averaging Parallel Plate Pitot for Heavy Particulate Applications

We accept ABT's baseline price and recommendation of Eastern Instruments for individual burner flow measurements subject to the following conditions which address our concerns with installation, accuracy, plugging, and probe failure:

Installation:

- 1) Eastern Instruments will work with Advanced Burner Tech to provide installation drawings and material for the tubing lines from the burner through the wind box wall: ie, tubing temperature expansion bends, hangers/supports and flex connections to allow wind box expansion.
- 2) The installation will be of the DPU transmitter, with no pressure or temperature density correction, but will have a 4-20 mA output to the DCS.
- 3) Stainless steel tubing is provided within our proposal to tie (header) the VAP's together and then forward the dP signal from the VAP pitot header to the bulkhead. The transmitter cabinets, one on each burner level, and will be installed with factory installed DPU differential pressure transmitters and manual isolation valve for manual purging. Tubing will be supplied from the transmitter cabinet to the pitots with necessary fittings, expansion joints and flex connections.
- 4) Includes four man-days for EI startup and hands on training time for plant personnel on the EI transmitter setup and calibration.

Accuracy:

Accuracy of better than 1.5% will be assured by:

- 1) Installing 4 pitot probes in each burner at 4 equal quadrants,
- 2) Doing initial CFD modeling to determine the predicted best probe location and designing the optimum holes in the perforated plate, and
- 3) Setting up full scale wind tunnel testing with the actual burner to verify that there is agreement better than 1.5% between the air flow in an AMCA/ANSI certified flow nozzle and the pitots in the burner. This will be done at flow velocities similar to those in the burner installation. A chamber simulating IPSC's wind box will be constructed of at least 10 ft x 10 ft x 10 ft with air flowing in from the side. Customer observations of the air flow testing will be encouraged and supported.

Pluggage:

- 1) Supplied continuous purge option provides positive pressure within the dP sensing chambers. The flow rate of continuous purge is so low that it does not affect biasing. Even if the balance in the purge was skewed 100%, it would only affect the dP by less than 1 to 2% (1 to 2% error in a worst case scenario).
- 2) Low turbulence and vortexes are expected due to the perforated plate, which will be designed according to CFD models to minimize turbulence and vortexes inside the burners.
- 3) Agree to IPSC withholding \$35K until the next extended outage opportunity (probably 1 to 2

years later) upon which time several probes will be removed and examined for pluggage. If significant pluggage has occurred those funds will be forfeited and applied to the cost of an Air Monitor purging system.

4) All the tubing will be installed with manual isolation valves and quick connections to allow for manual purging, should that be required on a routine basis and to allow for tubing leak testing on initial installation.

5) The VAP technology was designed to handle turbulent airflow streams better than other pitot technologies. Please note (contrary to popular belief) that cylindrical pitots as shown in Brandt's technical paper, do not handle turbulent (pitch and yaw) flows well at all (and this is also referenced by other technical authors as noted within the paper).

Probe Failure:

1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures or vibration or other unforeseen failure mode, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.

2) If we together (IPP & EI) determine the failure to not be an isolated anomaly (occurring in only 2 or 3 burners over an entire year), but rather to be inherent within several or many burners, Eastern Instruments will replace all 192 of the VAP/PA pitots as stated in Item #1 above. Eastern will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit. The new replacement probes will be provided within a timely period within 3 months minimum to meet IPSC's outage windows.

3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation (what is this known deviation?).

4) The replacement VAP/PA Pitots will carry a renewed 2 year guarantee from the time of installation.

5) Eastern believes the ceramic material to be superior to stainless steel, but stands strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum). Eastern would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Upon successful installation and performance, IPSC agrees that Eastern Instruments can use IPSC as a reference and publish the results in a white paper.

From: Matt Maragos <mmaragos@airmonitor.com>
To: Jerry Finlinson <Jerry-F@ipsc.com>, Phil H <Phil-H@ipsc.com>
Date: 10/21/2003 1:59:14 PM
Subject: Air Monitor's Revised Proposal

Gentlemen,

Please find these revisions to Air Monitor's proposal:

1. The price has been reduced by the amount of the purge systems (\$1500 per burner). The AUTO-purge systems are included with the price below.
2. One additional probe per burner has been included at no cost. For a total of three probes per burner.
3. One set of interconnect tubing per burner has been included at no additional cost.

Price for Forty-Eight (48) IBAM Systems = \$191,040.

Intermountain has been a great customer of Air Monitor, we appreciate your past business and look forward to a long term partnership providing the best airflow measurement systems available.

If you have any questions or concerns, please do not hesitate to contact us.

Thank you.

Sincerely,

Matt Maragos
Air Monitor Corporation

CC: "Dave Earley (CT)" <dearley@nc.rr.com>, Ken Hall <khpquip@earthlink.net>, James Nelson <James-N@ipsc.com>

IP7_030747

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 10/21/2003 9:07:54 AM
Subject: Re: Contract 04-45606-Unit 2 Low NOx Burners

Phil,
I attached it again. This is a .tif picture file. If you still can't open it, tell me what type picture file should I save it as so that you can read it?

Sal

----- Original Message -----

From: "Phil Hailes" <Phil-H@ipsc.com>
To: <sal@advancedburner.com>
Sent: Tuesday, October 21, 2003 10:22 AM
Subject: Re: Contract 04-45606-Unit 2 Low NOx Burners

> Sal,
>
> I can't open the file that you attached. Could you send it again
> please?
>
> Phil
>
> >>> "Sal Ferrara" <sal@advancedburner.com> 10/20/2003 12:24:57 PM >>>
> Phil,
> Attached is copy of the invoice from our insurance agent for 50% of the
> additional insurance premium to increase our liability limits. I don't
> recall who, either yourself or James Nelson asked me for this so that
> our Invoice No. A03008-1, dated 9/25/03, could be released for payment.
> Please let me know if you need anything else from me.
> regards,
> Sal
>

IP7_030748

From: Matt Maragos <mmaragos@airmonitor.com>
To: Phil Hailes <Phil-H@ipsc.com>, Sal Ferrara <sal@advancedburner.com>
Date: 10/24/2003 9:10:16 AM
Subject: Revised Proposal for Intermountain Power IBAMs

CC: Ken Hall <khpqup@earthlink.net>, Nick Ferri <Nwferri@msn.com>, "Dave Earley (CT)" <dearley@nc.rr.com>, Mike Stapf <mstapf@ix.netcom.com>, James Nelson <James-N@ipsc.com>, Jerry Finlinson <Jerry-F@ipsc.com>

From: Jerry Finlinson
To: Matt Maragos; Phil Hailes
Date: 10/23/2003 12:03:03 PM
Subject: Re: Air Monitor's Revised Proposal

Matt,

We appreciate your experience and pricing. We need to make a decision quickly, so that we can move forward with this project, as the selected flow vendor is expected to do CFD modeling of the internal burner flows and assist ABT in designing the perforated plate. I have assembled our understanding of your proposal terms, could you please review this document, update your proposal to include all the items on this document and forward a copy of the updated proposal to ABT and to us? We plan to include this document, with some clarifications/modifications in our contract document with ABT.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> Matt Maragos <mmaragos@airmonitor.com> 10/21/2003 1:51:17 PM >>>
Gentlemen,

Please find these revisions to Air Monitor's proposal:

1. The price has been reduced by the amount of the purge systems (\$1500 per burner). The AUTO-purge systems are included with the price below.
2. One additional probe per burner has been included at no cost. For a total of three probes per burner.
3. One set of interconnect tubing per burner has been included at no additional cost.

Price for Forty-Eight (48) IBAM Systems = \$191,040.

Intermountain has been a great customer of Air Monitor, we appreciate your past business and look forward to a long term partnership providing the best airflow measurement systems available.

If you have any questions or concerns, please do not hesitate to contact us.

Thank you.

Sincerely,

Matt Maragos
Air Monitor Corporation

CC: Dave Earley (CT); James Nelson; Ken Hall

IP7_030750

From: James Nelson
To: Jerry Finlinson; Phil Hailes
Date: 10/23/2003 7:51:25 AM
Subject: Fwd: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Lets get together and finalize this, this morning. thx

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/22/2003 3:19:14 PM >>>
Jerry,

We accept the addendum attached, as is.

Per my discussion with James Nelson, we only ask (and he was ok with this) that should automatic purging systems be required down the road (Item #3 under "Pluggage"), that Eastern Instruments gets first right of refusal to manufacture them for IPSC. Also, I believe that James did not have a problem with stating that IPSC would co-authoring along with Eastern Instruments, a published white paper, highlighting the results.

Again, we look forward to working with you and ABT on this project. If you have any further questions, please give me a call (919-345-6730).

Best Regards,

Tim

-----Original Message-----

From: Jerry Finlinson [<mailto:Jerry-F@ipsc.com>]
Sent: Thursday, October 16, 2003 6:23 PM
To: Tim Bodemann
Cc: James Nelson; Phil Hailes
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Tim,

Thanks for working with us on this contract and being willing to stand behind your product, your remedies are reasonable. We are working up an addendum to the contract that we'd like both your and our company presidents to sign outlining your commitment to this project. As you understand, since this is a first for ABT to have flow measurements in their burners and it is a first for your pitots to be installed in pulverized coal burners, there is a high level of uncertainty and risk for us. Eastern Instruments stands to benefit greatly if this project turns out as well as we all hope.

I have assembled all the emails containing items that we have agreed to pertaining to installation, accuracy, pluggage and probe failure. Please review and suggest modifications as required, James Nelson will also review it for us, but he is out Thurs and Friday, so won't be back on it until next week.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd

IP7_030751

Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/15/2003 4:04:02 PM >>>
James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

- 1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of the VAP/PA pitots as stated in Item #1 above.
- 3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.
- 4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to Jerry.
- 5) We believe the ceramic material to be superior to the stainless steel as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann
Sent: Tuesday, October 14, 2003 5:38 PM
To: 'Jerry Finlinson'

IP7_030752

Cc: Bill Morgan; James Nelson; Phil Hailes; sal@advancedburner.com; joel@advancedburner.com
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT

burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA pitots as needed."

We trust this will address and eliminate your concerns as stated below and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [<mailto:Jerry-F@ipsc.com>]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a coal burner flow.

We intend to connect the transmitter signal to our DCS and use that to balance the windbox air flow dampers with online control. So we'd like the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to 1121F and the coal pipe temps range from 615 to 785F. We often see backplate temperatures of 1200F. Obviously your probes could not survive that environment. Then when we have the occasional burner fire, the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate where the probes are located will be behind some turning vanes. Do you have measurements of the temperature in the location where we are proposing to put the probes? Is there an installed base using this type of burner, where they have measured the temps online? Have you done enough detailed CFD modeling that you can accurately predict the temperature?

We would hate to have all these nice aluminum probes droop down in service and have to go in and replace them all at the next outage. What

IP7_030754

is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large of a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F, can ABT guarantee that they will not exceed that temperature in this burner design?

If the probes melt and sag are you willing to replace them with some stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,

Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.
regards,
Sal

From: Matt Maragos <mmaragos@airmonitor.com>
To: Jerry Finlinson <Jerry-F@ipsc.com>, Phil H <Phil-H@ipsc.com>
Date: 10/21/2003 1:59:14 PM
Subject: Air Monitor's Revised Proposal

Gentlemen,

Please find these revisions to Air Monitor's proposal:

1. The price has been reduced by the amount of the purge systems (\$1500 per burner). The AUTO-purge systems are included with the price below.
2. One additional probe per burner has been included at no cost. For a total of three probes per burner.
3. One set of interconnect tubing per burner has been included at no additional cost.

Price for Forty-Eight (48) IBAM Systems = \$191,040.

Intermountain has been a great customer of Air Monitor, we appreciate your past business and look forward to a long term partnership providing the best airflow measurement systems available.

If you have any questions or concerns, please do not hesitate to contact us.

Thank you.

Sincerely,

Matt Maragos
Air Monitor Corporation

CC: "Dave Earley (CT)" <dearley@nc.rr.com>, Ken Hall <khpquip@earthlink.net>, James Nelson <James-N@ipsc.com>

IP7_030756

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/20/2003 4:14:41 PM
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

Please see our attached modifications for the addendum to the contract. I'll give you a call to discuss finalizing the addendum so we can commence engineering, fabrication, etc.

Best Regards,

Tim Bodemann
VP Sales & Marketing
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann
Sent: Friday, October 17, 2003 11:20 AM
To: Jerry Finlinson
Cc: James Nelson; Phil Hailes; sal@advancedburner.com;
joel@advancedburner.com
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

I just received the attached from you. We will review it today, and get back to you on Monday morning with our comments. Again, thank you and we look forward to working closely with Intermountain Power and ABT on the project.

Best Regards,

Tim

-----Original Message-----

From: Jerry Finlinson
Sent: Thu 10/16/2003 6:23 PM
To: Tim Bodemann
Cc: James Nelson; Phil Hailes
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners
Tim,

Thanks for working with us on this contract and being willing to stand behind your product, your remedies are reasonable. We are working up an addendum to the contract that we'd like both your and our company presidents to sign outlining your commitment to this project. As you understand, since this is a first for ABT to have flow measurements in their burners and it is a first for your pitots to be installed in pulverized coal burners, there is a high level of uncertainty and risk for us. Eastern Instruments stands to benefit greatly if this project turns out as well as we all hope.

I have assembled all the emails containing items that we have agreed

IP7_030757

to pertaining to installation, accuracy, pluggage and probe failure. Please review and suggest modifications as required, James Nelson will also review it for us, but he is out Thurs and Friday, so won't be back on it until next week.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/15/2003 4:04:02 PM >>>
James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

- 1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of the VAP/PA pitots as stated in Item #1 above.
- 3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.
- 4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to Jerry.
- 5) We believe the ceramic material to be superior to the stainless steel as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP

IP7_030758

Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann
Sent: Tuesday, October 14, 2003 5:38 PM
To: 'Jerry Finlinson'
Cc: Bill Morgan; James Nelson; Phil Hailes; sal@advancedburner.com;
'joel@advancedburner.com'
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA pitots as needed."

We trust this will address and eliminate your concerns as stated below and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com
<mailto:Jerry-F@ipsc.com>]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a coal burner flow.

We intend to connect the transmitter signal to our DCS and use that to balance the windbox air flow dampers with online control. So we'd like the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to 1121F and the coal pipe temps range from 615 to 785F. We often see backplate temperatures of 1200F. Obviously your probes could not survive that environment. Then when we have the occasional burner fire, the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate where the probes are located will be behind some turning vanes. Do

you
have measurements of the temperature in the location where we are
proposing to put the probes? Is there an installed base using this
type
of burner, where they have measured the temps online? Have you done
enough detailed CFD modeling that you can accurately predict the
temperature?

We would hate to have all these nice aluminum probes droop down in
service and have to go in and replace them all at the next outage.

What
is your confidence level in the burner environment? What guarantee
are
you willing to put forth? We hate to be the beta site on this large
of
a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F,
can ABT guarantee that they will not exceed that temperature in this
burner design?

If the probes melt and sag are you willing to replace them with some
stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,

Following up on your telephone discussion last Friday with Tim
Bodemann, Eastern Instruments is offering a high temperature guarantee
on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after
shipment) against workmanship and/or material defect. In addition, we
will guarantee for 1 year (up to 18 months after shipment) that the
VAP/PA pitots can withstand operating temperatures up to 1000 degrees
F

in the ABT burner as designed. Should the VAP/PA pitots structurally
fail at temperatures below the 1000 degree F range, Eastern
Instruments
will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as
IPSC makes a decision on the approved Airflow Measuring System
supplier.
regards,
Sal

IP7_030761

CC: "James Nelson" <JIM-N@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>, <sal@advancedburner.com>, <joel@advancedburner.com>

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/17/2003 9:25:09 AM
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

I just received the attached from you. We will review it today, and get back to you on Monday morning with our comments. Again, thank you and we look forward to working closely with Intermountain Power and ABT on the project.

Best Regards,

Tim

-----Original Message-----

From: Jerry Finlinson
Sent: Thu 10/16/2003 6:23 PM
To: Tim Bodemann
Cc: James Nelson; Phil Hailes
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Tim,

Thanks for working with us on this contract and being willing to stand behind your product, your remedies are reasonable. We are working up an addendum to the contract that we'd like both your and our company presidents to sign outlining your commitment to this project. As you understand, since this is a first for ABT to have flow measurements in their burners and it is a first for your pitots to be installed in pulverized coal burners, there is a high level of uncertainty and risk for us. Eastern Instruments stands to benefit greatly if this project turns out as well as we all hope.

I have assembled all the emails containing items that we have agreed to pertaining to installation, accuracy, pluggage and probe failure. Please review and suggest modifications as required, James Nelson will also review it for us, but he is out Thurs and Friday, so won't be back on it until next week.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp

IP7_030763

850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/15/2003
4:04:02 PM >>>

James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.

2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of the VAP/PA pitots as stated in Item #1 above.

3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.

4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to

Jerry.
5) We believe the ceramic material to be superior to the stainless steel as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an

IP7_030764

additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann
Sent: Tuesday, October 14, 2003 5:38 PM
To: 'Jerry Finlinson'
Cc: Bill Morgan; James Nelson; Phil Hailes;
sal@advancedburner.com;
'joel@advancedburner.com'
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow

IP7_030765

measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA pitots as needed."

We trust this will address and eliminate your concerns as stated below

and we look forward to initiating engineering and construction
on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in
a coal
burner flow.
We intend to connect the transmitter signal to our DCS and use
that to balance the windbox air flow dampers with online control. So
we'd like
the online signal to remain accurate over a many year time
period.

In our current burners the backplate temperatures range from 785
to 1121F and the coal pipe temps range from 615 to 785F. We often
see backplate temperatures of 1200F. Obviously your probes could
not survive that environment. Then when we have the occasional
burner fire,
the backplate temps go up over 1300 deg F.

We know these burners are a different design and the
backplate where the probes are located will be behind some turning vanes.
Do you
have measurements of the temperature in the location where we
are proposing to put the probes? Is there an installed base using
this type

IP7_030767

done of burner, where they have measured the temps online? Have you enough detailed CFD modeling that you can accurately predict the temperature?

We would hate to have all these nice aluminum probes droop down in service and have to go in and replace them all at the next outage.

What is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large of a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F, can ABT guarantee that they will not exceed that temperature in this burner design?

If the probes melt and sag are you willing to replace them with some stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM

>>>

Jerry,
Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F

in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.
regards,
Sal

CC: "James Nelson" <JIM-N@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>, <sal@advancedburner.com>, <joel@advancedburner.com>

From: Jerry Finlinson
To: Tim Bodemann
Date: 10/16/2003 4:23:37 PM
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Tim,

Thanks for working with us on this contract and being willing to stand behind your product, your remedies are reasonable. We are working up an addendum to the contract that we'd like both your and our company presidents to sign outlining your commitment to this project. As you understand, since this is a first for ABT to have flow measurements in their burners and it is a first for your pitots to be installed in pulverized coal burners, there is a high level of uncertainty and risk for us. Eastern Instruments stands to benefit greatly if this project turns out as well as we all hope.

I have assembled all the emails containing items that we have agreed to pertaining to installation, accuracy, pluggage and probe failure. Please review and suggest modifications as required, James Nelson will also review it for us, but he is out Thurs and Friday, so won't be back on it until next week.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/15/2003 4:04:02 PM >>>
James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

- 1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of the VAP/PA pitots as stated in Item #1 above.
- 3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.
- 4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to Jerry.
- 5) We believe the ceramic material to be superior to the stainless steel as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we

look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann
Sent: Tuesday, October 14, 2003 5:38 PM
To: 'Jerry Finlinson'
Cc: Bill Morgan; James Nelson; Phil Hailes; sal@advancedburner.com;
joel@advancedburner.com
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA pitots as needed."

We trust this will address and eliminate your concerns as stated below and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [<mailto:Jerry-F@ipsc.com>]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a coal burner flow.

We intend to connect the transmitter signal to our DCS and use that to balance the windbox air flow dampers with online control. So we'd like the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to 1121F and the coal pipe temps range from 615 to 785F. We often see backplate temperatures of 1200F. Obviously your probes could not survive that environment. Then when we have the occasional burner fire, the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate where the probes are located will be behind some turning vanes. Do you have measurements of the temperature in the location where we are proposing to put the probes? Is there an installed base using this type of burner, where they have measured the temps online? Have you done enough detailed CFD modeling that you can accurately predict the temperature?

We would hate to have all these nice aluminum probes droop down in

IP7_030772

service and have to go in and replace them all at the next outage. What is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large of a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F, can ABT guarantee that they will not exceed that temperature in this burner design?

If the probes melt and sag are you willing to replace them with some stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,

Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.
regards,
Sal

CC: James Nelson; Phil Hailes

IP7_030773

From: James Nelson
To: Jerry Finlinson; Tim Bodemann
Date: 10/15/2003 4:22:01 PM
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Tim,

I need you to be more definitive on two points associated with item 2. I can't tell what you mean by 'isolated'. As you say in item #3 we will know via degradation of the dP signal if the pitot has failed. If this were to occur we need clear commitment from you that you will manufacture and deliver new probes of a suitable material in a reasonable time frame. This must be the agreement for us to make a commitment to you. Both the commitment to replace based on sufficiently degraded signal and some agreeable time frame for manufacture and delivery.

Thanks, James

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 10/15/2003 4:04:02 PM >>>
James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

- 1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of the VAP/PA pitots as stated in Item #1 above.
- 3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.
- 4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to Jerry.
- 5) We believe the ceramic material to be superior to the stainless steel as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

IP7_030774

-----Original Message-----

From: Tim Bodemann

Sent: Tuesday, October 14, 2003 5:38 PM

To: 'Jerry Finlinson'

Cc: Bill Morgan; James Nelson; Phil Hailes; sal@advancedburner.com; joel@advancedburner.com

Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA pitots as needed."

We trust this will address and eliminate your concerns as stated below and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a coal burner flow.

We intend to connect the transmitter signal to our DCS and use that to balance the windbox air flow dampers with online control. So we'd like the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to 1121F and the coal pipe temps range from 615 to 785F. We often see backplate temperatures of 1200F. Obviously your probes could not survive that environment. Then when we have the occasional burner fire, the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate where the probes are located will be behind some turning vanes. Do you have measurements of the temperature in the location where we are proposing to put the probes? Is there an installed base using this type of burner, where they have measured the temps online? Have you done enough detailed CFD modeling that you can accurately predict the temperature?

We would hate to have all these nice aluminum probes droop down in service and have to go in and replace them all at the next outage. What is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large of a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F, can ABT guarantee that they will not exceed that temperature in this burner design?

If the probes melt and sag are you willing to replace them with some stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,

Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.
regards,
Sal

CC: Bill Morgan; joel@advancedburner.com; Phil Hailes; sal@advancedburner.com

IP7_030777

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>, "James Nelson" <JIM-N@ipsc.com>
Date: 10/15/2003 4:09:04 PM
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

James / Jerry,

Thank you for taking the time today to discuss your concerns on the project. I would like to summarize the solutions that we arrived at during our tele-conference to address the concerns:

- 1) Should the VAP/PA Pitots as quoted become damaged due to elevated temperatures, we will replace the VAP/PA pitots with either stainless steel or ceramic VAP/PA pitots of the same design; as long as the burner structure at the VAP/PA Pitot insertion location has not been damaged also as a result of elevated temperatures.
- 2) If we together (IPP & EI) determine the failure to not be isolated but rather to be inherent within several burners, we will replace all of the VAP/PA pitots as stated in Item #1 above.
- 3) We will most likely know if damage has occurred since the dP will degrade beyond a known standard deviation. We will fabricate the replacement pitots once the failure has been identified so they can be on site prior to a planned or forced outage for retro-fit.
- 4) The replacement VAP/PA Pitots will carry the same 2 year guarantee from the time of shipment as stated below in my 10/14/03 e-mail to Jerry.
- 5) We believe the ceramic material to be superior to the stainless steel as discussed during our telephone conversation. Though we still stand strongly behind the VAP/PA material selection as originally proposed for the project (hard anodized 6063 series aluminum), we would consider providing ceramic VAP/PA Pitots from the onset of the project for an additional cost of \$57,600.

Again, we trust this will address and eliminate your concerns and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Tim Bodemann
Sent: Tuesday, October 14, 2003 5:38 PM
To: 'Jerry Finlinson'
Cc: Bill Morgan; James Nelson; Phil Hailes; sal@advancedburner.com; joel@advancedburner.com
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA pitots as needed."

We trust this will address and eliminate your concerns as stated below and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive

IP7_030779

Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a coal burner flow.

We intend to connect the transmitter signal to our DCS and use that to balance the windbox air flow dampers with online control. So we'd like the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to 1121F and the coal pipe temps range from 615 to 785F. We often see backplate temperatures of 1200F. Obviously your probes could not survive that environment. Then when we have the occasional burner fire, the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate where the probes are located will be behind some turning vanes. Do you have measurements of the temperature in the location where we are proposing to put the probes? Is there an installed base using this type of burner, where they have measured the temps online? Have you done enough detailed CFD modeling that you can accurately predict the temperature?

We would hate to have all these nice aluminum probes droop down in service and have to go in and replace them all at the next outage. What is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large of a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F, can ABT guarantee that they will not exceed that temperature in this burner design?

If the probes melt and sag are you willing to replace them with some stainless probes provided by another vendor if necessary?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,

Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.
regards,
Sal

CC: "Bill Morgan" <BILL-M@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>, <sal@advancedburner.com>, <joel@advancedburner.com>

IP7_030781

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/14/2003 3:42:43 PM
Subject: RE: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,

We understand your concern as stated below. We have discussed the burner design and installation experience with ABT on the subject and would like to comment as follows:

As we know, the ABT burner is not similar in design to the currently installed B&W burners. We agree with you that the B&W backplate, as positioned in relationship to the furnace heat/radiant zone, is more susceptible to elevated temperatures (up to 1150 degrees F during normal service and 1300+ degrees F during burner fire). This is not the case with the ABT design.

We have worked diligently along with ABT on the designed, location, and duty of the VAP/PA Pitots within this burner application; thus the reason why the VAP/PA Pitots were chosen by ABT for this service. In our engineering analysis and design, we ensured that the VAP/PA airflow measurement location:

- a) was removed/isolated from the radiant heat zone,
- b) would withstand temperature elevations as seen when burner fire occurs within the coal/air pipes (as designed, sufficient cooling effect comes from the windbox air through the registers/perf plate), and
- c) would withstand potential elevated temperatures when burners, taken out of service, were at minimum burner register open settings (as little as 5%).

The ABT burner as designed and installed has not experienced these elevated temperatures as stated above, in the airflow measurement/air register zone. This is further indicative by the fact that warping of carbon steel components, in and near the airflow measurement zone, such as linkages, perf plate, etc., has not been detected on the ABT burners viewed during outages. Please note that carbon steel will degrade (warp, stress-relieve or creep) at elevated temperatures above 850 degrees F.

Again, this was an engineered application. Knowing the ABT burner design, the application, and the VAP/PA Pitot technology we will present the following guarantee to Intermountain Power, beyond our normal quality of workmanship and material defect guarantee:

"Eastern Instruments will guarantee for a period of two years once installed (up to 30 months after shipment) that the VAP/PA pitots will not structurally degrade as designed, and installed within the ABT burner due to the effects of elevated operational temperatures. Should replacements be required, Eastern Instruments will replace the VAP/PA pitots as needed."

We trust this will address and eliminate your concerns as stated below and we look forward to initiating engineering and construction on the project.

Regards,

Tim Bodemann
VP
Eastern Instruments
416 Landmark Drive
Wilmington, NC 28412
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com]
Sent: Tuesday, October 14, 2003 12:41 PM
To: sal@advancedburner.com; Tim Bodemann
Cc: Bill Morgan; James Nelson; Phil Hailes
Subject: Re: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Sal and Tim,

We are still feeling really nervous about the aluminum probes in a coal burner flow.

We intend to connect the transmitter signal to our DCS and use that to balance the windbox air flow dampers with online control. So we'd like the online signal to remain accurate over a many year time period.

In our current burners the backplate temperatures range from 785 to 1121F and the coal pipe temps range from 615 to 785F. We often see backplate temperatures of 1200F. Obviously your probes could not survive that environment. Then when we have the occasional burner fire, the backplate temps go up over 1300 deg F.

We know these burners are a different design and the backplate where the probes are located will be behind some turning vanes. Do you have measurements of the temperature in the location where we are proposing to put the probes? Is there an installed base using this type of burner, where they have measured the temps online? Have you done enough detailed CFD modeling that you can accurately predict the temperature?

We would hate to have all these nice aluminum probes droop down in service and have to go in and replace them all at the next outage. What is your confidence level in the burner environment? What guarantee are you willing to put forth? We hate to be the beta site on this large of a burner project.

It's good that you are guaranteeing the probes to be good up to 1000F, can ABT guarantee that they will not exceed that temperature in this burner design?

If the probes melt and sag are you willing to replace them with some stainless probes provided by another vendor if necessary?

Thanks, Jerry

IP7_030783

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/13/2003 3:10:46 PM >>>

Jerry,

Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.
regards,
Sal

CC: "Bill Morgan" <BILL-M@ipsc.com>, "James Nelson" <JIM-N@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>, <sal@advancedburner.com>, <joel@advancedburner.com>

IP7_030784

From: Jerry Finlinson
To: James Nelson
Date: 10/14/2003 3:13:24 PM
Subject: [Fwd: RE: [Fwd: IPSC ABT Burner Flow]]

James,

Take a look at what Air Monitor is proposing and give Ken Hall or Matt Maragos a call with questions. Would you prefer the 10% discount or the 3 probes?

Their base bid was \$263K for a 2 probe system, with a price increase over Eastern of \$111,700. So if we take a 10% discount of \$26,300 = \$236,700 or a delta of \$85,400. They have included additional work of adding the manifolds and tubing out to the CAMS panel. Plus CFD calculations of the perf plate design and burner internal flows from their contractor Air Flow Sciences.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> Ken Hall <khpquipp@earthlink.net> 10/14/2003 2:43:12 PM >>>
Jerry:

Following is Air Monitor's response to your recent email request. Please call me to discuss and I am more than willing to discuss this email with James if you think it would be a good idea.

----- Original Message ----- Subject: RE: [Fwd: IPSC ABT Burner Flow] Date: Tue, 14 Oct 2003 15:46:38 -0400 From: Matt Maragos <mmaragos@airmonitor.com> Reply-To: Matt Maragos <mmaragos@airmonitor.com> To: Ken Hall <khpquipp@earthlink.net>, "Dave Earley (CT)" <dearley@nc.rr.com>

Ken,

Per our conversation please find the following information:

1. Air Monitor will supply three probes per burner OR Air Monitor offers a 10% discount. Either way, we will test the burner with three probes and with two probes and report our findings to ABT and IPP.
2. Air Monitor will supply the tubing and fittings to manifold the probes, run the connections to the outside of the windbox and to the VELTRON II with AUTO-purge III systems.
3. Air Monitor will perform the wind tunnel testing and will introduce airflow from multiple directions to simulate the windbox conditions.
4. Air Monitor will work together closely with ABT to determine the ideal perforated plate, probe installation locations, the manifold of the probes, and everything else related to the airflow measurement systems.

We look forward to working together with ABT and IPP on this project.

Please let me know if you have any questions or concerns.

Thank you.

IP7_030785

Matt

-----Original Message-----

From: Ken Hall [<mailto:khppquip@earthlink.net>]

Sent: Tuesday, October 14, 2003 3:06 PM

To: Matt Maragos; David Earley

Subject: [Fwd: IPSC ABT Burner Flow]

Matt:

I had a long phone conversation with Jerry this morning and I told him to go talk to his boss James Nelson and ask him what Air Monitor needs to do to get this job.

Please call me to discuss I will give you the reasons behind why Jerry is asking for us to do all of the things listed below.

CC: Phil Hailes

IP7_030786

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/13/2003 3:00:48 PM
Subject: IPSC Contract 04-45606, Unit 2 Low NOx Burners

Jerry,
Following up on your telephone discussion last Friday with Tim Bodemann, Eastern Instruments is offering a high temperature guarantee on the VAP's as follows:

"The VAP/PA pitots are guaranteed for 1 year (up to 18 months after shipment) against workmanship and/or material defect. In addition, we will guarantee for 1 year (up to 18 months after shipment) that the VAP/PA pitots can withstand operating temperatures up to 1000 degrees F in the ABT burner as designed. Should the VAP/PA pitots structurally fail at temperatures below the 1000 degree F range, Eastern Instruments will replace the pitots as needed."

Please let me know if you have other questions or advise me as soon as IPSC makes a decision on the approved Airflow Measuring System supplier.

regards,
Sal

CC: "Phil Hailes" <Phil-H@ipsc.com>, "Jim Nelson" <JIM-N@ipsc.com>

From: Jerry Finlinson
To: Bill Morgan; James Nelson; Phil Hailes
Date: 10/8/2003 2:04:06 PM
Subject: [Fwd: IBAMs - Intermountain Power]

Air Monitor was kind enough to point out some disadvantages for us if we choose their competition, Eastern Instruments. Some of the points are not totally applicable, but several are.
see what you think,
Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> Ken Hall <khppquip@earthlink.net> 10/8/2003 11:32:48 AM >>>

Jerry:

I told Matt IPP was still seriously considering Eastern vs Air Monitor. I asked Matt if he would provide me with his thoughts on why buy Air Monitor vs Eastern. Matt's email was intended to assist me in putting together an email for you but I have decided to just forward you his email with understanding I should have toned it down before sending to IPP. In our discussion yesterday Eastern claims their probe will be as accurate as Air Monitor's and that there is no way to prove the accuracy of Air Monitor or Eastern probes. I believe Air Monitor can prove the accuracy of their probe through wind tunnel testing of your burner. Air Monitor can also prove that in every case where wind tunnel testing was performed to determine the proper position and location of the probes the probes provided a repeatable and accurately characterized reading in the field on over 3,000+ burners. I do believe Air Monitor's accuracy is proven and that it is possible for us to tell you the accuracy of our probe and have the data from the field installations to support it.

Dave Earley and I have discussed the importance of this job with the President of Air Monitor and the potential of a second Unit. Air Monitor believes they have the most experience in the industry in measuring burner Air Flow and they want to supply IPP with the best measurement system in the industry. Air Monitor has agreed to offer IPP a 10% discount on all Air Monitor equipment purchased for this project. I hope this will assist IPP in purchasing an Air Monitor system where temperature, pluggage, and accuracy of the probes will never be a concern to the plant.

Thank you for all the time you have taken to consider Air Monitor for this application! Please call me if you have any questions.

----- Original Message ----- Subject: IBAMs - Intermountain Power Date: Tue, 7 Oct 2003 13:45:02 -0400 From: Matt Maragos <mmaragos@airmonitor.com> Reply-To: Matt Maragos <mmaragos@airmonitor.com> To: Ken Hall <khppquip@earthlink.net> CC: Dave Earley (CT) <dearley@nc.rr.com>

Ken, You may have to tame some of this and take out some of my passion, sorry sometimes I get a little excited. Most important with regard to purge, is item 7. Eastern Instruments transmitters actually have an optional controller for a purge system. Yes, you read that correctly. See below for more detail. Here are a few items that come to my mind:

1. Accuracy. Air Monitor has proven their accuracy in this application. >From what Jerry told me, Eastern has not EVER been installed in a burner. Additionally, Jerry told me that one of Eastern's references said that they need to relocate their probes to a different location because the Eastern probes could not

IP7_030788

measure accurately in "turbulent conditions". Turbulence is all that you have in a burner application. The signal from the Eastern probes will be so incredibly noisy that you will never be able to characterize it accurately.

2. Wind Tunnel vs. CFD. CFD is almost pointless to characterize the probe. It can only model specific cases and in no way can it properly model the turbulent environment of a burner. Our wind tunnel testing is the most accurate method to characterize a measurement. NASA has not even given up using their wind tunnel and they have the MOST POWERFUL CFD tools on Earth. They know that you cannot fully model in a computer and you must build and test. Eastern Instruments is using a home made CFD program that was conceived and developed by one man (Bob Brandt - he owns most/all of Eastern Instruments). How can you believe the results from a CFD program that has never been used for anything this complex before? How can you confirm that there are not errors in the programming of this patchwork CFD modeling program that will produce gross errors that will never be known because no one can verify the code, no actual testing was done and no testing can be done in the field?

3. Experience. Air Monitor has been in business for over 30 years. Combined airflow measurement experience of hundreds of years between all of our technical people. Air Monitor has tested more than a dozen different burners in our wind tunnel, plus a ton of other duct work configurations and flow elements. We have the MOST experience and knowledge in this industry. Air Monitor will be here for at least another 30 years and we have outlasted the other fly-by-night airflow measurement companies. Eastern, although they have been "in business" since 1984, they only have had airflow measurement systems since about 2000 or 2001.

4. Guarantee. Since Air Monitor is going to be around for a long time, our performance guarantee and warranties mean something. Other companies tend to throw out guarantees and push the physical properties of the material they use beyond the limits without regard for the end user. They will begone after the problems start. Air Monitor, as Jerry knows from experience, has been and will be there to supply the best in quality and performance.

5. Temperature. Air Monitor makes aluminum probes for the HVAC market. Aluminum is used because it is cheap, especially in an extrusion. Air Monitor will not use an Aluminum probe in an application over 400°F, yes it can take more heat, but it is just not good engineering practice. The high temp characteristics of aluminum just are not up to the task. It is an HVAC product and aluminum products are not meant for the abuse from a power utility plant. Maybe in a low temperature application aluminum is OK, but in a burner the temperatures could easily exceed 700°F (Eastern's published limit). Eastern has even turned away business that needed a maximum just over 700°F, so I am not sure why they have changed their tune now and are guaranteeing to 900° to 1000°F. If they get the order, this would be the largest project that Eastern would have ever received, so maybe the dollar value is affecting their judgement.

6. Purge. The need to keep the probes clean from airborne particulate. Air Monitor knows that purge is required for any type of pneumatic sensing device installed in an application where airborne particulate is present. Eastern claims no purge is required for their probe. Eastern has no purge system. A reliable purge system would cost a small fortune to develop (ask Air Monitor how we know). It is much easier to just claim the probes do not need purge than to do the right thing and provide a purge system. There are some applications in the Utility industry that do not need purge, e.g., combustion air downstream of a tubular preheater. No carry over of flyash, relatively clean air stream. We have seen sensing holes (on other manufacturers' probes) placed in every conceivable configuration. All had pluggage issues. ABT used one of these manufacturers on a previous project. That manufacturer told them no purge was required. The flow element manufacturer left the jobsite shortly after start up and were never heard from again - even though there were "guarantees". Then the end user starts having problems and has to call Air Monitor, the only manufacturer that knows how to measure combustion air accurately and RELIABLY. That end user now has Air Monitor systems. And he is an Air Monitor reference (I believe Jerry spoke with him). The claim of no purge requirement is a smokescreen to secure a big order, take the money and run.

7. Purge continued. This one deserves its own line item. IF EASTERN DOESN'T REQUIRE A PURGE

SYSTEM, THEN WHY WOULD THEIR TRANSMITTER HAVE AN OPTIONAL PURGE AIR CONTROLLER????!?!?! I have attached the document (reference page 2 of their brochure), and here it is, "Controller can be optionally fitted with an air purge. This helps keep foreign material and moisture from invading the transmitter lines." Why would they need this if they can simply reverse the orientation of their probe to prevent particulate from ever entering the probe? They will try to come up with some lame excuse, but the fact is they KNOW that purge is required and they account for adding it into their own systems! They don't want to add it because they don't have it. But even if they could rig together a purge system, they know the dollars that purge system will add to the project will not make them as competitive and then they will not be considered as a viable option!

Please let me know if you have any questions. Thank you. Matt

CC: Aaron Nissen; Garry Christensen

From: Jerry Finlinson
To: Sal Ferrara
Date: 10/7/2003 1:07:47 PM
Subject: Re: IPSC questions

Ouch, this is starting to go over budget. I need to review with James Nelson and Phil before we give the final ok. James is out for a couple days. His wife just had a baby. We know you need to get started, so we'll try to finalize the decision soon.

We'd like to get the price down on the inner air zone. How much would it be if we have only one probe and no continuous purge? We'd still need valves for the option of manual purge.

Don't do the release yet.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 10/7/2003 12:38:51 PM >>>

Jerry,

The cost difference is an additional \$92,750 to supply the DPS for a variable temperature compensated signal output. The additional supply for this temperature compensation includes two temperature elements (temperature transmitters) for each burner windbox, and a DPS-Differential Pressure System transmitter on each burner (versus the DPU dP transmitter originally proposed).

Also, the total price to provide a separate register inner air zone flow measurement on the burners would be an additional \$99,050. The scope on each burner would include (2) VAP pitots, root valves, stainless steel tubing, fittings, continuous purge, a magnahelic gauge for local indication, and installation.

Are we released to go with Eastern Instruments for the burner flow measurement? We don't need an answer right away on the above additional scope, however we do need to now get started on the CFD modeling portion.
regards,
Sal

----- Original Message -----

From: "Jerry Finlinson" <Jerry-F@ipsc.com>
To: <sal@advancedburner.com>
Sent: Wednesday, October 01, 2003 2:22 PM
Subject: Re: IPSC questions

> Thanks Sal,
> We wanted to know what the cost difference is between the DPU and
> the DPS, then we can decide if the extra expense is worth the improved
> accuracy.

> Thanks, Jerry
>
> Jerry Finlinson, Engineer
> Intermountain Power Service Corp
> 850 West Brush Wellman Rd
> Delta, UT 84624
> 435-864-6466 fax 0776/6670
> jerry-f@ipsc.com
>
> >>> "Sal Ferrara" <sal@advancedburner.com> 10/1/2003 11:44:17 AM >>>
>
> IPSC questions Jerry/Tim,
> IPSC should investigate the amount of SA temperature fluctuation
> occurring over the boiler's control range. Knowing this, the maximum
> inaccuracy introduced into the flow measurement, utilizing the DPU, can
> be determined by EI. With the DPU transmitter, a fixed temperature would
> be programmed into the transmitter for the compensation. The temperature
> used for this would be from the middle of the range to minimize this
> inaccuracy, i.e. if temperature fluctuates between 600-700 deg then 650
> deg. would be used for the compensation giving maximum error being
> introduced by the 50 deg delta. I used EI's price for the DPU
> transmitter in our offer, instead of the DPS price with integral
> temperature element on every pitot, since I do not expect that the SA
> temperature fluctuations will be significant enough to matter in the
> measurement.
> regards,
>
> Sal Ferrara
>
>
> ----- Original Message -----
> From: Tim Bodemann
> To: Jerry Finlinson
> Cc: Jim Knapp ; joel@advancedburner.com ; sal@advancedburner.com ;
> JIM-N@ipsc.com ; Phil-H@ipsc.com ; AARON-N@ipsc.com ; BILL-M@ipsc.com
> ; Garry-C@ipsc.com
> Sent: Wednesday, October 01, 2003 12:35 AM
> Subject: RE: IPSC questions
>
>
> Jerry,
>
>
>
>
> 4) Yes, we can provide what you want within a
> pressure/temperature (density) compensated transmitter (our DPS). We
> have quoted this option to ABT...we will discuss this with ABT so they can
> forward onto you (if not already) the cost associated with this option.
>
>
> Again, thank you for your time and we look forward to our
> teleconference and a successful installation.
>
>
>

>
>
> Best Regard,
>
>
>
> Tim
>
>
>
>

CC: Bodemann@EasternInstruments.com; Phil Hailes

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/2/2003 12:51:10 PM
Subject: RE: Eastern pluggage warranty and accuracy

Jerry,

To summarize our telephone conference today:

1) We WILL guarantee our flow measurement, as installed within the ABT burner, to be accurate WELL within your requested 3% of the "primaries". The "primaries" being the NIST traceable/certified nozzles within our AMCA/ANSI airflow test stand.

We will do the CFD modeling AND if desired, we will test the full size ABT burner with VAP's installed within our AMCA/ANSI airflow test stand. Included, we will construct a header (chamber) which the burner will fit in, to simulate the windbox. Again, please note, that since we are doing the CFD modeling upfront, we will not have to "play" with any design changes or pitot placement adjustments once we receive the burner, thus the turnaround time will be minimal for our airflow test stand testing, correlation, and verification.

2) We addressed the Pitot pluggage issue during our teleconference. Even in turbulent airflow, the pitot has been designed not to allow particulate into the sensing holes. On the side plate sensing holes, there is "boundary separation" and on the trailing holes the VAP design does not create vortex shedding (eddy currents), thus no pluggage and no buildup on the trailing edge. The design we are working with ABT on minimizes turbulence as the flow exists the perf plate onto the VAP Pitots. The perf plate of which we are assisting ABT in the design (CFD modeling) is a nice means of flow straightening for the VAP's as well as a means to optimize the burners performance as stated by ABT. To back this up, we WILL agree to a withholding of a portion of the project monies until examination during the next outage in a year....this by far is the best way to relay our confidence in the technology/design.

3) I re-iterate item number "3" below about the purging. Summary: the continuous purge (if you would like to utilize that option) provides positive pressure to the dP sensing chambers. Even if there is a 100% offset in the continuous purging from one side to the other (ie., purging flow only into one sensing line of the two), it would affect the dP to the transmitter by no more than a 1 to 2% error. Thus, you shouldn't have to "play" with the continuous purge once installed. Also continuous purge does not place the CFM and PSI demand (CFM cost and maintenance) on your plant air system as required with an automatic "blow back" purge system. I have seen automatic "blow back" purges cause flyash to solidify like cement within pitots due to condensate found within the plant air.....danger, danger.

4)The VAP technology was designed to handle turbulent airflow streams better than other pitot technologies. Please note (contrary to popular belief) that cylindrical pitots as shown in the paper I e-mailed to you this week, do not handle turbulent (pitch and yaw) flows well at all (and this is also referenced by other technical authors as noted within the paper).

5) Our proposal includes (4) VAP pitots per burner at the four equal quadrants. We would be glad to quote (2) per burner as did our competition, BUT we feel (4) are necessary since the airflow rate into all four quadrants may not be completely uniform.

6) We will discuss the installation of "inner barrel" pitots with ABT per Aaron's request. We will provide a price to ABT to include additional inner barrel VAP pitots, continuous purge, and applicable magnahelic gauges. I will have those prices to ABT by Monday.

7) We will work with ABT to provide installation drawings for the dP tubing lines from the burner to the windbox wall; ie., tubing temperature expansion bends, hangers/supports, etc. Stainless steel tubing is provided within our proposal to tie (header) the VAP's together and then forward the dP signal from the VAP pitot header to the bulkhead.

8) We will provide a revised proposal to ABT for a temperature compensated output 4-20mADC signal. We heard that you are not interested in pressure compensating since the windbox pressure is stable (please let us know if that is not the case and if you want pressure compensation too). Per your request, the temperature compensation will require two temperature elements (temperature transmitters) for each windbox, and the DPS-Differential Pressure System transmitters (versus the DPU dP transmitter). Although we did originally give ABT numbers for the DPS as well as for the DPU transmitter, the DPS scope has changed slightly since now each burner does not require its own temperature element (now only two temperature elements per windbox), but we will need to split the temperature signal to the (6) DPS transmitters within each panel. I will have those prices to ABT by Monday.

If you have any further questions, please call me; cell (919) 345-6730. We know that we will work well, together with ABT on this project as we have with them on past projects. We are looking forward to providing an accurate, engineered flow measurement system on the ABT burners for Intermountain Power.

Best Regards,

Tim Bodemann
(910) 392-2490 ext 16

-----Original Message-----

From: Jerry Finlinson [mailto:Jerry-F@ipsc.com]
Sent: Wednesday, October 01, 2003 2:18 PM
To: Tim Bodemann
Subject: RE: Eastern pluggage warranty and accuracy

Tim,

It sounds like you are willing to guarantee the accuracy to within 3%, but that you are not committed to do the wind tunnel testing. Can you commit to not only the CFD modeling and but doing the wind tunnel testing in

the 10 ft x 10 ft x 10 ft minimum size chamber with the air blowing in the side?

We are also still nervous about the pluggage issue, especially in this highly turbulent burner inlet. You have stated that you are confident that we'll be OK and should only need to do a manual purge once a year on the outage. What kind of guarantee can you give us for pluggage. Are you willing to back it up with a performance bond or let us withhold 20% of the price for one year and we'll examine them at the next outage to determine the pluggage? What can you do to reduce our risk?

A separate item is that our performance guy, Aaron, sees great value in knowing the inner air flow separately from the overall air flow. Could you give us a ballpark estimate for putting 2 or 3 short 4 inch probes into the inner air zone only and pipling that out to a gauge? We'd like to be able to have a continuous purge on that, which we could disable. That would be on all 48 burners.

What is the ballpark cost difference of the DPU and DPS transmitter?

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Tim Bodemann" <bodemann@easterninstruments.com> 9/30/2003 10:35:57 PM >>>
Jerry,

Yes, I too think we got alot accomplished during our phone call today. As for the salesmanship.....well.....I just think I know our product and capabilities real well.....the tough part is to try to convey that message (capabilities) as accurately and concise as possible....so with that said, I thank you for your complement!

Our Technical Director, our Engineering Manager, and I look forward to our conference call with you and your people on Thursday at 9:00am

Mountain Time.

To answer your questions (and we will re-address these questions during the conference call):

1) Our spec sheet states 700F and this number is conservative. We provide pitots that span 20' duct cross-sections, with a safety factor of 4 on tensile strength at that temperature. For your application we will be installing 16" VAP Pitots, capable of withstanding 900+F with a safety factor of 2 on tensile strength.

2) Our VAP Pitots are repeatable and as stated during our telephone conversation today, we will guarantee accuracy to match within 1 to 1 % of the "primaries" (the NIST traceable nozzles) within our AMCA/ANSI airflow test stand. CFD Modeling is a necessity on this project. AMCA/ANSI airflow test stand (wind tunnel) testing of the burner will be provided if desired.

3) Purging. Our continuous purge (if you would like to utilize that option that we will provide within our system at your request), provides positive pressure within the dP sensing chambers. The flow rate of continuous purge is so low that it does not affect our biasing. Even if the balance in the purge was skewed 100%, it would only affect our dP by less than 1 to 2% (1 to 2% error in a worst case scenario). I would like our Technical Director to re-emphasize during our conference call the technology behind our "non-plugging VAP/PA Pitot design and why it has been successfully installed in heavy particulate applications.

4) Yes, we can provide what you want within a pressure/temperature (density) compensated transmitter (our DPS). We have quoted this option to ABT...we will discuss this with ABT so they can forward onto you (if not already) the cost associated with this option.

Please see the attached example of our engineered solution to measuring airflow within a short duct run. This is the Midwest Gen Homer City project where we are replacing a recently installed competitor's \$250K primary flow measurement system, which never worked from the first day. Like your burner, this duct work had no straight duct run. Again, we take an approach not to just stick pitots into a duct and assume that it will react similar to another duct configuration...hence the need for the CFD modeling as good engineering practice upfront...prior to cutting metal. Please contact Russ Wingard from Homer City at 724-479-6265. Though we have shipped the solution and they will be installing the equipment in November, Russ/Homer City is very excited about our technology and approach to their measurement issue. We are looking forward to writing a white paper on the project and presenting it during the next Power Gen.

Also attached is a reference paper on the "Analysis of a Cylindrical Pitot". This helped explain for me on why the Feichheimer pitot works sometimes and why it doesn't work other times. A must for reading!

Again, thank you for your time and we look forward to our teleconference and a successful installation.

Best Regard,

Tim

-----Original Message-----

From: Jerry Finlinson
Sent: Tue 9/30/2003 7:30 PM
To: Tim Bodemann
Cc: Jim Knapp
Subject: IPSC questions

IP7_030798

Tim,

I was good to visit with you today, you are a good salesman.

We still have some concerns that you need to convince us of.

spec
sheet

1. Can the aluminum material handle the temperature. Your

says 700F.

What kind of warranty or remedy if it fails?

installed

2. What is your guaranteed accuracy? Can you guarantee 3%

and how to verify that?

We'd like to see you do CFD and wind tunnel testing of a mockup windbox, similar to what Air Monitor has done.

trouble

3. Purging - we don't really like continuous purge, we've had

why have

with ours in the past. How is your's better, if not necessary

eventual

it? Explain why particles don't impinge in holes and cause

plugging. Several guys have problems with this claim.

pressure

4. We'd like to see the DPS transmitter with temperature and

windbox

correction. You could have one thermocouple on each end of the

thermocouples all

and use it for 3 transmitters. So that would be 16

have ABT

together. Does your baseline price include that? If not then

include the full complement on the baseline price.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

CC: "Jim Knapp" <JIM-KNAPP@ipsc.com>, <joel@advancedburner.com>,
<sal@advancedburner.com>, <JIM-N@ipsc.com>, <Phil-H@ipsc.com>, <AARON-N@ipsc.com>,
<BILL-M@ipsc.com>, <Garry-C@ipsc.com>, "James Seagraves" <seagraves@easterninstruments.com>,
"Robert Brandt" <rbrandt@easterninstruments.com>

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Sal Ferrara" <sal@advancedburner.com>, "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 10/1/2003 8:27:51 PM
Subject: RE: IPSC questions

Good point Sal. Jerry, let us know what the SA temperature delta will be and we can give you the exact error you would see if we assumed (programmed in) a mid-point temperature and it fluctuated to the max and min. Even more important is the change in static pressure within the duct. Do you have a min and max for that too?

Regards,

Tim

-----Original Message-----

From: Sal Ferrara
Sent: Wed 10/1/2003 1:44 PM
To: Tim Bodemann; Jerry Finlinson
Cc: Jim Knapp; joel@advancedburner.com; JIM-N@ipsc.com;
Phil-H@ipsc.com; AARON-N@ipsc.com; BILL-M@ipsc.com; Garry-C@ipsc.com
Subject: Re: IPSC questions

Jerry/Tim,

IPSC should investigate the amount of SA temperature fluctuation occurring over the boiler's control range. Knowing this, the maximum inaccuracy introduced into the flow measurement, utilizing the DPU, can be determined by EI. With the DPU transmitter, a fixed temperature would be programmed into the transmitter for the compensation. The temperature used for this would be from the middle of the range to minimize this inaccuracy, i.e. if temperature fluctuates between 600-700 deg then 650 deg. would be used for the compensation giving maximum error being introduced by the 50 deg delta. I used EI's price for the DPU transmitter in our offer, instead of the DPS price with integral temperature element on every pitot, since I do not expect that the SA temperature fluctuations will be significant enough to matter in the measurement.

regards,

Sal Ferrara

----- Original Message -----

From: Tim Bodemann
<mailto:bodemann@easterninstruments.com>
To: Jerry Finlinson <mailto:Jerry-F@ipsc.com>
Cc: Jim Knapp <mailto:JIM-KNAPP@ipsc.com>;
joel@advancedburner.com <mailto:joel@advancedburner.com>;
sal@advancedburner.com <mailto:sal@advancedburner.com>; JIM-N@ipsc.com
<mailto:JIM-N@ipsc.com>; Phil-H@ipsc.com <mailto:Phil-H@ipsc.com>;
AARON-N@ipsc.com <mailto:AARON-N@ipsc.com>; BILL-M@ipsc.com
<mailto:BILL-M@ipsc.com>; Garry-C@ipsc.com <mailto:Garry-C@ipsc.com>
Sent: Wednesday, October 01, 2003 12:35 AM
Subject: RE: IPSC questions

Jerry,

Yes, I too think we got alot accomplished during our phone call today. As for the salesmanship.....well.....I just think I know our product and capabilities real well.....the tough part is to try to convey that message (capabilities) as accurately and concise as possible....so with that said, I thank you for your complement!

Our Technical Director, our Engineering Manager, and I look forward to our conference call with you and your people on Thursday at 9:00am Mountain Time.

To answer your questions (and we will re-address these questions during the conference call):

1) Our spec sheet states 700F and this number is conservative. We provide pitots that span 20' duct cross-sections, with a safety factor of 4 on tensile strength at that temperature. For your application we will be installing 16" VAP Pitots, capable of withstanding 900+F with a safety factor of 2 on tensile strength.

2) Our VAP Pitots are repeatable and as stated during our telephone conversation today, we will guarantee accuracy to match within 1 to 1 ½ % of the "primaries" (the NIST traceable nozzles) within our AMCA/ANSI airflow test stand. CFD Modeling is a necessity on this project. AMCA/ANSI airflow test stand (wind tunnel) testing of the burner will be provided if desired.

3) Purging. Our continuous purge (if you would like to utilize that option that we will provide within our system at your request), provides positive pressure within the dP sensing chambers. The flow rate of continuous purge is so low that it does not affect our biasing. Even if the balance in the purge was skewed 100%, it would only affect our dP by less than 1 to 2% (1 to 2% error in a worst case scenario). I would like our Technical Director to re-emphasize during our conference call the technology behind our "non-plugging VAP/PA Pitot design and why it has been successfully installed in heavy particulate applications.

4) Yes, we can provide what you want within a pressure/temperature (density) compensated transmitter (our DPS). We have quoted this option to ABT...we will discuss this with ABT so they can forward onto you (if not already) the cost associated with this option.

Please see the attached example of our engineered solution to measuring airflow within a short duct run. This is the Midwest Gen Homer City project where we are replacing a recently installed competitor's \$250K primary flow measurement system, which never worked from the first day. Like your burner, this duct work had no straight duct run. Again, we take an approach not to just stick pitots into a duct and assume that it will react similar to another duct configuration...hence the need for the CFD modeling as good engineering practice upfront...prior to cutting metal. Please contact Russ Wingard from Homer City at 724-479-6265. Though we have shipped the solution and they will be installing the equipment in November, Russ/Homer City is very excited about our technology and approach to there measurement issue. We are looking forward to writing a white paper on the project and presenting it during the next Power Gen.

Also attached is a reference paper on the "Analysis of a Cylindrical Pitot". This helped explain for me on why the fechheimer pitot works sometimes and why it doesn't work other times. A must for reading!

Again, thank you for your time and we look forward to our teleconference and a successful installation.

Best Regard,

Tim

-----Original Message-----

From: Jerry Finlinson
Sent: Tue 9/30/2003 7:30 PM
To: Tim Bodemann
Cc: Jim Knapp
Subject: IPSC questions

Tim,

I was good to visit with you today, you are a good salesman.

We still have some concerns that you need to

IP7_030802

convince us of.

1. Can the aluminum material handle the temperature. Your spec sheet says 700F.
What kind of warranty or remedy if it fails?
2. What is your guaranteed accuracy? Can you guarantee 3% installed and how to verify that?
We'd like to see you do CFD and wind tunnel testing of a mockup windbox, similar to what Air Monitor has done.
3. Purging - we don't really like continuous purge, we've had trouble with ours in the past. How is your's better, if not necessary why have it? Explain why particles don't impinge in holes and cause eventual plugging. Several guys have problems with this claim.
4. We'd like to see the DPS transmitter with temperature and pressure correction. You could have one thermocouple on each end of the windbox and use it for 3 transmitters. So that would be 16 thermocouples all together. Does your baseline price include that? If not then have ABT include the full complement on the baseline price.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

CC: "Jim Knapp" <JIM-KNAPP@ipsc.com>, <joel@advancedburner.com>, <JIM-N@ipsc.com>, <Phil-H@ipsc.com>, <AARON-N@ipsc.com>, <BILL-M@ipsc.com>, <Garry-C@ipsc.com>, "Robert Brandt" <rbrandt@easterninstruments.com>, "James Seagraves" <seagraves@easterninstruments.com>

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 9/30/2003 10:41:43 PM
Subject: RE: IPSC questions

Jerry,

Yes, I too think we got alot accomplished during our phone call today. As for the salesmanship.....well.....I just think I know our product and capabilities real well.....the tough part is to try to convey that message (capabilities) as accurately and concise as possible....so with that said, I thank you for your complement!

Our Technical Director, our Engineering Manager, and I look forward to our conference call with you and your people on Thursday at 9:00am Mountain Time.

To answer your questions (and we will re-address these questions during the conference call):

- 1) Our spec sheet states 700F and this number is conservative. We provide pitots that span 20' duct cross-sections, with a safety factor of 4 on tensile strength at that temperature. For your application we will be installing 16" VAP Pitots, capable of withstanding 900+F with a safety factor of 2 on tensile strength.
- 2) Our VAP Pitots are repeatable and as stated during our telephone conversation today, we will guarantee accuracy to match within 1 to 1 ½ % of the "primaries" (the NIST traceable nozzles) within our AMCA/ANSI airflow test stand. CFD Modeling is a necessity on this project. AMCA/ANSI airflow test stand (wind tunnel) testing of the burner will be provided if desired.
- 3) Purging. Our continuous purge (if you would like to utilize that option that we will provide within our system at your request), provides positive pressure within the dP sensing chambers. The flow rate of continuous purge is so low that it does not affect our biasing. Even if the balance in the purge was skewed 100%, it would only affect our dP by less than 1 to 2% (1 to 2% error in a worst case scenario). I would like our Technical Director to re-emphasize during our conference call the technology behind our "non-plugging VAP/PA Pitot design and why it has been successfully installed in heavy particulate applications.

4) Yes, we can provide what you want within a pressure/temperature (density) compensated transmitter (our DPS). We have quoted this option to ABT...we will discuss this with ABT so they can forward onto you (if not already) the cost associated with this option.

Please see the attached example of our engineered solution to measuring airflow within a short duct run. This is the Midwest Gen Homer City project where we are replacing a recently installed competitor's \$250K primary flow measurement system, which never worked from the first day. Like your burner, this duct work had no straight duct run. Again, we take an approach not to just stick pitots into a duct and assume that it will react similar to another duct configuration...hence the need for the CFD modeling as good engineering practice upfront...prior to cutting metal. Please contact Russ Wingard from Homer City at 724-479-6265. Though we have shipped the solution and they will be installing the equipment in November, Russ/Homer City is very excited about our technology and approach to there measurement issue. We are looking forward to writing a white paper on the project and presenting it during the next Power Gen.

Also attached is a reference paper on the "Analysis of a Cylindrical Pitot". This helped explain for me on why the fechheimer pitot works sometimes and why it doesn't work other times. A must for reading!

Again, thank you for your time and we look forward to our teleconference and a successful installation.

Best Regard,

Tim

-----Original Message-----

From: Jerry Finlinson
Sent: Tue 9/30/2003 7:30 PM
To: Tim Bodemann
Cc: Jim Knapp
Subject: IPSC questions

Tim,

IP7_030805

I was good to visit with you today, you are a good salesman.

We still have some concerns that you need to convince us of.

1. Can the aluminum material handle the temperature. Your spec
sheet says 700F.
What kind of warranty or remedy if it fails?
2. What is your guaranteed accuracy? Can you guarantee 3%
installed
and how to verify that?
We'd like to see you do CFD and wind tunnel testing of a mockup
windbox, similar to what Air Monitor has done.
3. Purging - we don't really like continuous purge, we've had
trouble
with ours in the past. How is your's better, if not necessary
why have
it? Explain why particles don't impinge in holes and cause
eventual
plugging. Several guys have problems with this claim.
4. We'd like to see the DPS transmitter with temperature and
pressure
correction. You could have one thermocouple on each end of the
windbox
and use it for 3 transmitters. So that would be 16
thermocouples all
together. Does your baseline price include that? If not then
have ABT
include the full complement on the baseline price.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

CC: "Jim Knapp" <JIM-KNAPP@ipsc.com>, <joel@advancedburner.com>,
<sal@advancedburner.com>, <JIM-N@ipsc.com>, <Phil-H@ipsc.com>, <AARON-N@ipsc.com>,
<BILL-M@ipsc.com>, <Garry-C@ipsc.com>

From: Jerry Finlinson
To: Aaron Nissen; Bill Morgan; Garry Christensen; James Nelson; Jim Knapp; Jon Christensen; Jon Finlinson; Ken Nielson; Phil Hailes; Wes Bloomfield
Date: 9/29/2003 5:00:17 PM
Subject: Burner Air Flow - Eastern vs Air Monitor

FYI,

I have put together a list of the advantages and disadvantages of Eastern Instruments and Air Monitor pitots and transmitters on the new Advanced Burner Tech burners for U2.

Air Monitor has proposed to have a conference call with us Wednesday at 9am to answer any more questions that we might have.

ABT would like us to have a decision by Friday of this week.

Please review these and see if you have any further questions or input that we need to research.

Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> "Sal Ferrara" <sal@advancedburner.com> 9/23/2003 5:24:54 PM >>>

Phil,

Jerry Finlinson asked me to provide you with a proposal to incorporate Air Monitor's (AMC) airflow measuring system on our burners in place of the Eastern Instruments (EI) system currently included in our scope of supply. Note that we chose to offer EI's system for application on our burners since we believe it is the most cost effective approach in obtaining reliable and repeatable burner airflow measurement. We also believe that due to the EI probe design, it is less susceptible to plugging in uses where ash particles are entrained in the measuring medium. The EI probe construction also lends itself to minimal air consumption when continuous purge air is desired in lieu of periodic manual purging.

Attached is Air Monitor's proposal for a complete system, including auto-purge which we believe is essential to AMC's design to insure long term reliable and repeatable flow measurement. AMC's scope also includes physical flow modeling on a mock up of our burner which would be conducted in their lab.

We believe both the AMC and EI systems are adequate and can be provided in time to meet your delivery requirements. Their approaches differ slightly in support of their system designs in that AMC includes physical flow modeling and EI includes CFD modeling, each to determine final calibration of the equipment to obtain accurate measurement in our burner register. Another difference is that AMC includes provisions for a high volume, high pressure intermittent purge system where EI includes provisions for a low pressure, low volume continuous purge system. Lastly, the AMC system proposed suggests 2 probes per burner and the EI system incorporates 4 probes (AMC plans to test the performance difference between two probes and three probes, and if there is a significant difference, there would be an additional cost of \$635 per burner to supply the third probe).

The price difference for ABT to supply the AMC proposed system, instead of EI's system, is an additional \$111,770 (considers AMC's offer with two probes per burner). I can not justify the additional cost to go to

the AMC system and therefore recommend staying with the EI system as originally proposed. I do however understand from my discussion with Jerry Finlinson that there may be some benefit to the plant to go with AMC, since AMC equipment is utilized elsewhere in the in the plant (I expect that IPSC will consider this benefit as part of their evaluation).

Please let me know if you have any additional questions. We would like IPSC's final decision on which airflow measuring system to use by 10/3/03, so we can begin coordinating implementation of our register design into the measuring system modeling and maintain the delivery schedule.

regards,
Sal Ferrara

From: Jerry Finlinson
To: Aaron Nissen; Bill Morgan; Garry Christensen; James Nelson; Jon Finlinson; Ken Nielson; Phil Hailes
Date: 9/29/2003 1:27:21 PM
Subject: Fwd: Air Monitor's IBAM Systems

Here's a response from Air Monitor regarding their IBAM burner air flow system.
Air Monitor would like to do a conference call with us Wed 9am, is that a good time?

I'm putting together a list of the advantages and disadvantages of Air Monitor vs Eastern Instruments.
Thanks, Jerry

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> Matt Maragos <mmaragos@airmonitor.com> 9/29/2003 1:16:19 PM >>>
Jerry,

Ken told me you had a couple questions on our IBAM systems.

1. Do all purges purge at once? No. The panels will be grouped six per enclosure (one enclosure per burner deck/side), within each enclosure the purges will be sequential.
2. Where will the burner probes be located? Looking at the ABT burner, there is very little space to mount the probes anywhere but ABT's preferred location (which is right downstream of the sleeve damper - they should relocate the perforated plate closer to the sleeve damper - then the IBAM probes will be mounted just downstream of the perforated plate). We can test more locations, but taking into account how compact the burner is, downstream of this location presents the same challenge - accurate measurement with virtually no straight run.
3. How can you account for differences within the windbox that will force air in from the left/right/top/bottom or variation thereof in wind tunnel testing? We have a windbox attached to our wind tunnel that allows us to deliver air to the burner in varying directions to accurately simulate the real world conditions.
4. CFD vs. Wind Tunnel testing. Air Monitor will perform either. Any CFD model must make many assumptions and will not be as accurate as the wind tunnel testing. To the best of my knowledge, the CFD used by Eastern Instruments is a home made version of software. We use Fluent. From our experience, Fluent has the most capability for accurately modeling burners, much more capable than Eastern's software (unless they have recently upgraded). Eastern will be forced to make many assumptions, just to get the program to completely resolve the model. Even with Fluent, concessions must be made in the CFD model. The wind tunnel allows for actual testing and the most complete and accurate information. Others cannot offer a wind tunnel test, but we can offer either a wind tunnel test or top end CFD modeling. We strongly recommend the wind tunnel as we know the results will be better than CFD.

Please let us know if you have any questions or concerns.

Thank you.

Sincerely,

Matt Maragos
Air Monitor Corporation

IP7_030810

From: "Tim Bodemann" <bodemann@easterninstruments.com>
To: "Jerry Finlinson" <Jerry-F@ipsc.com>
Date: 9/24/2003 12:05:35 AM
Subject: ABT Burner - Eastern Instruments Air Flow

Jerry,

Per your request, attached are answers to your questions and I have provided further information for your review.

If you have any questions, please give me a call.

Best Regards,

Tim Bodemann
cell (919) 345-6730

CC: "Aaron Nissen" <AARON-N@ipsc.com>, "Bill Morgan" <BILL-M@ipsc.com>, "Garry Christensen" <Garry-C@ipsc.com>, "James Nelson" <JIM-N@ipsc.com>, "Phil Hailes" <Phil-H@ipsc.com>, <sal@advancedburner.com>, <joel@advancedburner.com>

From: Jerry Finlinson
To: Phil Hailes
Date: 9/22/2003 7:20:12 AM
Subject: Fwd: Unit 1 PA Flow Calibration

Jerry Finlinson, Engineer
Intermountain Power Service Corp
850 West Brush Wellman Rd
Delta, UT 84624
435-864-6466 fax 0776/6670
jerry-f@ipsc.com

>>> Bill Morgan 9/19/2003 7:22:55 AM >>>

In using the air monitor mass flow for primary air, the pulverizers have been scaled for 0 to 100% airflow in mass flow of 0 to 137,000 lb/hr.

Bill

IP7_030812

From: "Sal Ferrara" <sal@advancedburner.com>
To: "Phil Hailes" <Phil-H@ipsc.com>
Date: 9/23/2003 5:16:27 PM
Subject: IPSC Contract 04-45606 - Burner Airflow Measurement

Phil,

Jerry Finlinson asked me to provide you with a proposal to incorporate Air Monitor's (AMC) airflow measuring system on our burners in place of the Eastern Instruments (EI) system currently included in our scope of supply. Note that we chose to offer EI's system for application on our burners since we believe it is the most cost effective approach in obtaining reliable and repeatable burner airflow measurement. We also believe that due to the EI probe design, it is less susceptible to plugging in uses where ash particles are entrained in the measuring medium. The EI probe construction also lends itself to minimal air consumption when continuous purge air is desired in lieu of periodic manual purging.

Attached is Air Monitor's proposal for a complete system, including auto-purge which we believe is essential to AMC's design to insure long term reliable and repeatable flow measurement. AMC's scope also includes physical flow modeling on a mock of our burner which would be conducted in their lab.

We believe both the AMC and EI systems are adequate and can be provided in time to meet your delivery requirements. Their approaches differ slightly in support of their system designs in that AMC includes physical flow modeling and EI includes CFD modeling, each to determine final calibration of the equipment to obtain accurate measurement in our burner register. Another difference is that AMC includes provisions for a high volume, high pressure intermittent purge system where EI includes provisions for a low pressure, low volume continuous purge system. Lastly, the AMC system proposed suggests 2 probes per burner and the EI system incorporates 4 probes (AMC plans to test the performance difference between two probes and three probes, and if there is a significant difference, there would be an additional cost of \$635 per burner to supply the third probe).

The price difference for ABT to supply the AMC proposed system, instead of EI's system, is an additional \$111,770 (considers AMC's offer with two probes per burner). I can not justify the additional cost to go to the AMC system and therefore recommend staying with the EI system as originally proposed. I do however understand from my discussion with Jeremy Finlinson that there may be some benefit to the plant to go with AMC, since AMC equipment is utilized elsewhere in the plant (I expect that IPSC will consider this benefit as part of their evaluation).

Please let me know if you have any additional questions. We would like IPSC's final decision on which airflow measuring system to use by 10/3/03, so we can begin coordinating implementation of our register design into the measuring system modeling and maintain the delivery schedule.

regards,
Sal Ferrara

CC: "Jerry Finlinson" <Jerry-F@ipsc.com>, "joel vatsky" <joel@advancedburner.com>